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No. 155

CONTENTS PAGE

CONTENTS (Continued) Page

SUB-SAHARAN AFRICA

CONTENTS (Continued) Page

WESTERN EUROPE

GREECE

SPAIN

PACIFIC ISLAND TO BE TURNED INTO NUCLEAR DUMP

Canberra THE AUSTRALIAN in English 13 Oct 77 p 1

[Article by Andrew Fowler]

[Text]

A PLAN to turn a Pacific island into a dump for the world's nuclear waste is being studied by an international group of atomic energy experts.

The scheme is seen as a near-certain way of ensuring that the dangerous waste does not fall into the wrong hands.

Governments throughout the world, including Australia, will be represented at a special meeting of the International Institute of Applied Systems Analysis in Vienna to discuss the plan.

The scheme was revealed last night in Sydney by Professor Carroll Wilson, an energy expert from the United States who has flown to Australia to address a symposium on energy to be opened by the Prime Minister, Mr Fraser, in Canberra next week.

It is understood that no specific island has so far been suggested, but it would have to be as far away from habitation and earthquake zones as possible, and acceptable to the major powers.

He said the island would be heavily guarded and the waste checked regularly by the International Atomic Energy Agency.

The plan is one way world governments could solve the huge problem of what to do with the waste from uranium after it has been used in a reactor. For plutonium can be extracted from the waste to build atomic weapons.

Professor Wilson, 67, is a former general manager of the U.S. Atomic Energy Commission. He is now at the Massachusetts Institute of Technology.

"The concept of putting all the waste on an island until we decide to refine it into plutonium or not is immensely appealing," he said.

"The containers holding the waste could be placed either in the ground or in, say, 15m of water, which would act as a radiation shield."

A national opinion poll published yesterday shows most Australians support the Federal Government's decision to mine and export uranium.

The poll, carried out by the Roy Morgan Research Centre for the Uranium Producers Forum, showed 57 per cent agreed with the decision, 30 per cent disagreed and 13 per cent were undecided.

CSO: 5000

BRIEFS

NUCLEAR WASTE PROBLEM--The new South Wales minister for health, Mr (Stewart), tonight confirmed that there were nuclear waste problems on the foreshores of Sydney Harbor. Mr (Stewart) was commenting on a claim by the federal deputy opposition leader, Mr Uren, that there was significant radioactive contamination in the Nelson parade area in the Sydney suburb of Hunters Hill. Mr (Stewart) said there was radioactive waste on four blocks of land in the street, and the government was working with the federal government to find ways of disposing of it. He said the wastes consisted of tailings capable of producing radon gas which could cause cancer. [Text] [Melbourne Overseas Service in English 1230 GMT 1 Dec 77 OW]

CSO: 5000

HANDLING OF NUCLEAR WASTE SPARKS PUBLIC DEBATE

Melbourne THE AGE in English 12 Oct 77 p 8

[Article by Michael Richardson: "The Waste That Won't Go Away"]

[Text] Michael Richardson reports from Toronto on the handling of nuclear waste and the growing Canadian public debate on the issue.

AT FIRST glance it seems like an Olympic-size indoor swimming pool with stewards checking the water in preparation for a race.

Except that no competitors ever appear and the "stewards" — about a dozen of them — are dressed in waterproof white or brown overalls and wear rubber gloves and boots.

There are other odd things about this pool that visitors gaze at through a plate glass window. It literally glows. The color is an eerie aquamarine, a kind of science fiction blue.

Experts call it the Cherenkov effect. The water glows because it's being used to cool and shield the intensely radioactive spent fuel from four nearby nuclear reactors.

Being beside the pool is no health hazard for the technicians in their safety helmets. But it's not advisable to fall in or let any of the water touch your skin.

Looking through the window of the spent fuel storage bay here at the Pickering atomic power station on the shore of Lake Ontario, just 36 kilometres northeast of Canada's biggest city, Toronto, a visitor can clearly see the metal box frames in which the used fuel rods are stored.

Managing these toxic by-products of the Pickering power station — which has generated more electricity more efficiently than any other nuclear plant in the world since it began operation six years ago — is not a short-term problem.

A growing number of Canadians, particularly here in Ontario Province where over a third of the country's 23.3 million people live, are starting to wonder whether there may be unacceptably high long-term risks in accumulating nuclear wastes.

Debate on this question — one of the main issues in Australia's emotional and politically partisan uranium furore — will move a step closer in Canada next week when the Federal Government publishes a Green Paper on waste management.

Canada currently ranks sixth among the world's nations in the production of nuclear-generated electricity. Five per cent of the country's electric capacity is now nuclear, mostly in Ontario.

Barring unforeseen difficulties, atomic power output will double over the next five years and by the turn of the century might supply 40 per cent of Canada's electricity and one quarter of its total energy needs.

After 25 years of painstaking development, Canadian science and technology have produced a reliable commercial-scale reactor using natural uranium as a fuel and heavy water as a means of moderating or controlling the chain reaction when uranium atoms split.

It is this self-sustaining fission that generates an even and enormous supply of heat energy.

Many experts believe the Canadian reactor system is safer and more cost-efficient than the US and European reactors, powered by expensive enriched uranium and using light water as a moderator, which have so far cornered most of the non-communist world market.

But because of its relative efficiency, the Canadian reactor produces in spent fuel more plutonium per unit of energy generated than any other commercial thermal reactor, although in terms of quantity the amount is still small — 0.4 per cent of used fuel.

It is the plutonium factor that lies at the heart of public anxiety about long-term management of surplus nuclear material.

Some of the fission products and all of the so-called actinides like plutonium in spent fuel are radioactive, emitting penetrating radiation and heat as they decay.

Some fission products decay very rapidly, returning to a stable, harmless form after only a few days. Plutonium, on the other hand, takes 250,000 years to return to a radioactive level one thousandth of its original strength.

Most fission products decay to this degree in three hundred years.

It is therefore imperative for these materials to be shielded, cooled and isolated from the environment and humans in safe storage.

In Canada's case, the problem requires decision and resolution because of the growing number of nuclear power reactors coming on stream.

At the Pickering plant — about 90 per cent of all the spent fuel in the country is stored in one pool.

I was told the bay contained at least 60,000 bundles, or roughly 13,000 tonnes of spent fuel.

Compared with other industries, the mass and volume of waste products are extremely small.

What about longer term storage and permanent disposal plans?

Dr. J. A. L. Robertson, a senior scientist at the Chalf River laboratories run by the Atomic Energy of Canada Ltd., a Crown corporation created in 1952 to develop peaceful uses of nuclear energy, says: "Design and testing of alternative facilities are at present under way to allow the future transfers of this fuel to centralised, supervised depositories for the next 20 to 25 years."

This is an interim storage plan. It may take the form of a single multi-bay complex for spent fuel from all reactors in Canada.

Another alternative being developed is storage in large concrete cannisters where the used fuel is welded inside metal cans to provide additional isolation.

This dry storage has the advantage of needing less maintenance than water-filled pools. Meanwhile, Dr. Robertson says AECL will be conducting an extensive research and testing programme on permanent disposal of radioactive wastes in the ground.

But no decision can be made about burial until after the world, and Canada, decide what to do with the plutonium in spent fuel.

While this fission product is a key component for manufacturing nuclear bombs, it can also be reprocessed to fuel atomic power plants.

It has been calculated that by the year 2000 the plutonium in Canadian spent fuel will have an energy equivalent to several billion barrels of oil.

AECL is looking ahead to the time when spent fuel will probably be recycled to recover plutonium and unburned uranium, leaving the unusable wastes — amounting to about 1 per cent of the fuel by weight — to be disposed of underground.

Although a number of options are being studied, the most promising possibility involves sealing nuclear wastes in highly insoluble glass blocks and placing them in deep subterranean chambers.

AECL hopes to have a demonstration geological disposal facility in operation by 1986.

Critics of nuclear power argue that underground "garbage pits" for surplus radioactive material have not yet been shown to be safe.

Perhaps of more significance, they suggest that the necessity for very long-term storage of nuclear wastes constitutes a potentially lethal legacy to countless future generations.

So they advocate a moratorium on further nuclear power development until a proven storage method is available.

The question Canadian authorities — and both sides in the Australian nuclear debate — will be watching closely in the months ahead is whether an overwhelming majority of Canadians are similarly persuaded.

CSO: 5000

CEMA COOPERATION ON ENVIRONMENTAL PROTECTION CITED

East Berlin PRESSE-INFORMATIONEN in German No 128, 28 Oct 77 pp 5-6

/"Facts and Figures" report by Press Office of Chairman, GDR Council of Ministers: "Cooperation Among CEMA Countries for Environmental Protection and Efficient Use of Natural Resources"/

/Text/ The present level of scientific-technical progress within CEMA member nations has made it possible to develop at a fast pace material production designed to increase the prosperity of their people, but it has produced a new and important problem for science and technology: solution of problems involving protection and improvement of the environment and efficient use of natural resources.

The main avenues of development selected at the 25th CPSU Party Congress for the USSR economy covering the 1976-1980 period call for conducting comprehensive research on natural resources, monitoring the condition of the environment and sources of its pollution in the interest of guaranteeing the social reproduction process, and initiating consistent measures in support of comprehensive and efficient use of natural resources.

The SED's program calls particularly upon the industrial enterprises, agricultural producer cooperatives and state farms to help protect and improve the natural environment in the interest of an effective economy and a steady improvement in working and living conditions for the workers. The other socialist countries have set similar goals designed to preserve and improve natural environmental conditions.

The state organs and social organizations of CEMA member nations are planning and putting into practice specific measures designed to protect and improve the environment and to make efficient use of natural resources. They are aimed primarily at establishing conditions conducive to more effective and productive work, comprehensive use of natural resources as an important source of economic growth and increased effectiveness of social production. They are

also directed toward creating optimal conditions for the daily lives of the working people --protection and improvement of nature's potential in the interest of future generations.

The CEMA Committee on Scientific-Technical Cooperation has drafted the "General Comprehensive Program of Cooperation Among CEMA Member Nations and the Socialist Federative Republic of Yugoslavia in the Area of Protection and Improvement of the Environment and Efficient Use of Natural Resources for the Period up to 1980." This program was approved by the CEMA Executive Committee in October 1974. It contains 11 comprehensive problems covering 159 research topics with a number of specific tasks. It forms the basis of collaboration by 15 CEMA commissions, mainly those for the chemical industry, machine construction, non-ferrous metallurgy, geology, construction, public health and the conference of managers of water management organs.

More than 360 research and development organizations of CEMA member nations and the Socialist Federative Republic of Yugoslavia are helping carry out the joint program. In addition, main lines of scientific-technical cooperation in the field of protection and improvement of the environment and efficient use of natural resources have also been drawn up for the period between 1981 and 1990.

The cooperation is being carried out by 16 CEMA standing commissions and 8 councils of deputies concerned with the individual problems. Overall organization is the responsibility of the Council on Questions of Environmental Protection and Improvement, an organ of the CEMA Committee on Scientific-Technical Cooperation. As of 1976, more than 750 studies had been concluded as a result of this cooperation.

With regard to the problem entitled "Socioeconomic, Organizational-Legal and Pedagogical Aspects of Environmental Protection," substantial attention is being paid to dealing with issues that involve interrelations between environmental protection, ecology and economy. Twenty-three scientific institutes in the CSSR, the USSR, the People's Republic of Poland, the GDR, the Hungarian People's Republic and the People's Republic of Bulgaria have been studying this problem.

Methods for economic and non-economic assessment of the effect of man on the environment have already been developed. These methods are now undergoing experimental testing in typical model areas of several CEMA member nations, including industrially developed regions, agricultural and recreational areas, large cities, transitional areas and other zones.

In 1975, international field tests were conducted in an industrially developed model area in the district of Ostrava (CSSR). The tests are to be continued in the period ahead in the other areas, zones and centers mentioned.

All together, 30 research organizations from 8 socialist countries are studying the problem entitled "Hygienic Aspects of Environmental Protection." Instead of 23 topics as planned, 25 have already been written up. A whole series of results are on record. Some of these pertain to the hygiene of water and water supply systems in residential areas, soil hygiene and the public health aspects of noise. An example of this work is a set of analytical methods for the bacterial and biological analysis of drinking water and surface water. These methods are being used by specialists and chemists at research institutes, sanitation and hygiene inspection services, hydrometeorological stations and hygiene laboratories in industrial enterprises to determine water quality.

With respect to the problem entitled "Protection of the Atmosphere from Pollution by Contaminants," the efforts by specialists from the cooperating organizations are aimed at developing technological procedures that produce little or no waste and new and effective methods and installations designed to remove impurities from harmful industrial exhaust gases. They are also working to develop control and measuring apparatus and procedures for reducing emissions from vehicles with combustion engines.

A two-phase method has been devised for recovering hydrocarbons from ventilation gases produced by the viscose fiber industry. This method has been introduced in a number of chemical enterprises in interested CEMA member nations. Use of the method has increased the productivity of the adsorbents twice over and has insured observance of air pollution hygiene standards.

The managers of CEMA member-nation water management organs have agreed on a total of 25 topics. Among them are comprehensive utilization of water resources and their protection from pollution, flood control, economy in water management, hydraulics, hydrotechnology and water supply systems.

For example, the USSR coordinated the work of seven countries on determining precise norms governing water requirements and drainage in industry and residential areas. Norms were established for 2,500 kinds of products in the 18 most important branches of industry. These norms are being used in the development of prognoses and technical-economic substantiations and in the project-planning and reconstruction of water supply and sewage systems in industrial centers and residential areas. They are also used in the drafting of development plans covering comprehensive utilization and

protection of the water resources of entire regions or of a country.

Water requirements and drainage systems were studied in many localities in all the member countries in order to determine scientifically based norms on the irregularity of water and drainage requirements. These studies obtained information for use in planning water supply and sewage systems. As a result of these studies, several countries have already changed their previously existing norms and standards.

7458
CSO: 2300

IMPACT OF ENVIRONMENT ON MILITARY MANPOWER POOL EXAMINED

Belgrade VOJNO DELO in Serbo-Croatian No 4, Jul-Aug 77 pp 50-62

[Article by Col Rajko Vukosavljevic, M.D.; Milan Plavsic, graduate economist, M.A.; Lt Col Milic Todosijevic, M.D.; and Lt Col Dusan Milovanovic, engineer]

[Text] Introductory Remarks

Along with its beneficial influence, the human environment can also have a considerable adverse effect on human health. The adverse effect of the environment on people's health and ability to work is manifested first of all in the increasing level of pollution of the immediate environment, changes in the ecosphere and harmful consequences which various aggressive noxae from man's broader or more narrow environment are bringing upon human health. It is with good reason that the World Health Organization incorporated this problem into its definition of health in that it stated that "health is not just the absence of disease, but complete mental, physical and economic well-being in a healthy human environment."

It is well known that man's constant struggle for a higher standard of living and higher position in society is moving people by the millions from rural to urban environments. This is a phenomenon of global proportions and since ancient times has been a part of human society, manifesting itself particularly in the second half of this century. The results of research so far on the impact of the environment on the health of a population has been revealing a particular pattern in the pathology of today's urban settlements. The term "pathology of urban settlements" in this context refers to the sum total of disruptions of the physical and mental health of a man who is born and who lives in an urban environment.

In discussing the impact of the environment on man's health and ability to work, then we must especially distinguish the adverse effect of the urban environment on the health of children and young people, which means on the health of the military manpower pool as well.

The military manpower pool in Yugoslavia has been systematically studied from all those viewpoints important to assessment of fitness for military service and to appropriate assignment to the proper branches and services. Within the system assessment of fitness and evaluation of the health of draftees, of their morphological characteristics, and of their physical and functional abilities represent important components which have scientific interest and which are also important when we study the consequences of the environment's impact on the health and fitness of recruits.

The study of recruits has from the very beginning shown that the environment is having a definite effect on the health and fitness of the military manpower pool and even on the morphological characteristics of draftees, which once were assumed to be determined primarily by genetics.

The environment in which a young man develops and grows can affect his fitness for military service in various ways, both favorably and adversely. For example, certain illnesses which had had a great influence on assessment of fitness (underdevelopment, tuberculosis, rickets, etc.) have been considerably reduced because of the rise in the general standard of living, improved diet and water supply and better housing. On the other hand, the increasingly rapid development of large urban environments is also bringing with it a number of harmful factors which represent a threat to the physical and social environment and are thus having an adverse effect on human health and psychosomatic conditions, and assessment of fitness for military service is thereby affected.

Results of Surveys and Discussion

1. Certain Demographic Populations and the Military Manpower Pool

Before we move on to presentation of the results of the study of environmental impact on the health and fitness of recruits, we shall present certain data on migration of population from rural to urban areas in the advanced countries and developing countries and then the share of the farm population in the total Yugoslav population and the percentage of recruits coming from farm or industrial and handicraft occupations so as to obtain a clearer insight into the stratum of population, i.e., young men of draft age, whose lives are lived under the effect of the factors of the urban or rural environment.

On the basis of past attention paid to this phenomenon it has been established that world population migrations have had the result that in 1950 approximately the same share of the population in the advanced countries was in urban settlements as in rural settlements (51:49 percent). However, the process of migration has been steadily accelerating, and by 1970 those countries had only one-third of the population in rural areas, while more than two-thirds of the total population were in urban settlements (34:66 percent). We should also stress that demographers foresee that by the end of this century less than one-fifth of the population of the advanced countries will be living in rural areas, while more than four-fifths of the

total population of those countries will be in urban settlements (19:81 percent).

The pattern of migrational movements in the developing countries is essentially different. There is every prospect according to present forecasts of specialists that even by the year 2000 these countries will not reach the ratio of urban to rural population (43:37 percent) which the advanced countries had at mid-century. However, migrational movements in recent decades unambiguously demonstrate that the rural-urban population transfer is speeding up even in these countries and that they are moving fast into a civilized industrial future in which the environment will be increasingly polluted and degraded.

Migrational movements of population in Yugoslavia show an accelerated decline in the percentage of the farm population in the total population. Whereas in 1948 the farm population had a share of 67.2 percent in Yugoslavia, that share in 1961 had fallen to 50.2 percent, and by 1971 it was only 36.4 percent of the total population of Yugoslavia.

This decline in the percentage of the farm population in the total population is evident in all republics and autonomous provinces and especially in the industrially advanced regions of our country. For example, the share of the farm population in the total population of Slovenia was 46.7 percent in 1948, 31 percent in 1961, and only 18.3 percent in 1971.

The study of recruits over the last 10 or 15 years has shown that they have been steadily shifting from the one occupational category to the other.

The results obtained show that the percentage of recruits from farm occupations in Yugoslavia as a whole has dropped from 35.9 percent (in 1962) to only 16.4 percent (1975). However, the percentage of recruits in the category of industrial and handicraft occupations has grown over that same period from 16.2 percent to 45.7 percent. A similar trend in the decline of the percentage of recruits from farm occupations and the pattern of growth of the percentage of those with industrial and handicraft occupations are evident in all republics and autonomous provinces and especially in the economically advanced regions of our country.

These data indicate directly or indirectly that every year there are more recruits that have been living and working under the impact of an urbanized human environment, and this has been affecting their health and assessment of their fitness for military service.

2. Impact of the Environment on the Fitness of Recruits

a) General Trends

Under present regulations draftees are considered fit for military service if they can serve their regular term of military service in the YPA [Yugoslav People's Army] without any sort of limitations. The percentage of

draftees found fit certainly depends on the health of the population of young men, but it also depends on the criteria used in assessing fitness. It has been established that the health of our population as a whole, including young men, is steadily improving. This fact and certain other actions which have been taken have brought about a steady increase year after year in the percentage of recruits found fit for military service.

However, if we make a comparison of the results obtained in assessment of the fitness of recruits in 1962 and 1975, we find that certain regions of our country (primarily those which are more industrially developed and urban) have "deteriorated" in relative terms, while others (the less industrially developed and rural areas) have "improved" their rankings over that period.

Although the percentage of recruits found fit for military service in 1975, taken as a whole, is considerably higher, in that same year it was found that not only certain confined areas of large urban centers, but their entire demographic region,* have undergone an essential shift in the rankings over the interval of 14 years between these two dates when the fitness of recruits was evaluated.

It was found that the demographic regions of Ljubljana, Zagreb, Sarajevo and Skopje have dropped in the rankings (they have a lower percentage of those found fit relative to other regions) and were in 1975 at the very bottom of the rankings, while in 1962 they were in the upper half of the list.

Over that same interval the Sar demographic region (Sarski kraj) improved its position from last place, 79th, which it held in 1962, to 15th place on the list in 1975, Kosovo moved from 74th to 23d place, Ukrina moved from 49th to 6th place, while Trebinje moved from 44th to 4th place on the list, and so on.

This phenomenon can be explained by the fact that in 1962 the principal reason for rejection by the YPA was undernourishment and underdevelopment of recruits, particularly in certain areas of our country (in 1962 we still had the wartime generation of recruits born in 1944). As the economy developed, and especially with the general rise in the standard of living of the population, the condition of underdevelopment--and especially undernourishment--ceased to be the principal problem in assessment of fitness. Other "true" illnesses, physical defects and impairments have now become most important among the reasons for unfitness.

The results obtained, then, show that all the major industrial places and large urban environments (city opstinas), in which environmental pollution is higher, have in all the republics and autonomous provinces experienced a drop in their position in the rankings between these two dates of assessment

* The "demographic regions of the survey" are areas covering several opstinas of similar demographic and socioeconomic composition.

of fitness of recruits for military service. Opstinas with less industrial development, and that means less pollution of the environment as well, where there tends to be more a convergence of mixed and rural settlements, have considerably improved their position in the rankings.

In addition to objective medical findings at the time of induction and assessment of the fitness of recruits, we considered it useful during the 1975 census of soldiers to also obtain a subjective assessment of the general health of soldiers by their immediate superior officers.

The method used in obtaining this assessment of the general health of servicemen was that the immediate superior officers (not physicians) use their knowledge of their own men, the duties which they perform at their assigned jobs and their behavior as soldiers, including requests for medical aid, in making a subjective assessment of their health, which they assigned to one of four categories which were offered: quite good health, good health, unsatisfactory for present duty assignment and health generally unsatisfactory. We can on the whole be satisfied with the assessment immediately superior officers made of their men with respect to their state of health. On the basis of the answers obtained we found that on the date of the census 81.4 percent of the men in the YPA had quite good health, 16.6 percent had good health, 1.8 percent were unfit for their duty assignment and 0.2 percent were unfit in general. Viewed as a whole, the officers were dissatisfied with the state of health of only 2 percent of their men. Here again the large urban environments, the capitals of the republics and autonomous provinces, were supplying men in a poorer state of health, while purely rural environments and mixed settlements were providing recruits in a better state of health.

On the other hand the objective indicators of morphological characteristics of recruits show that those from large cities are considerably better nourished and even "formally" better developed. At one time these were our basic indicators explaining the high percentage of recruits found fit in these areas. Today we see that the situation has changed considerably under the impact of various factors, including the environment.

b) Reasons for Limited Fitness for Military Service

Recruits classified as "fit for limited service" do serve their term of military service, but they are not assigned to all branches and services, but are ordinarily sent to certain easier and less demanding duty assignments. Their training makes great difficulties for officers in units, and we certainly are interested in analyzing the reasons why their fitness for service is limited.

The results obtained show that by far the most common reasons for limited fitness are illnesses, above all functional impairments of vision. By and large we are talking about slight anomalies in refraction: shortsightedness and squints which occur in early childhood and are far more common in urban than in rural environments (63.4:23.8 pro mille). Impairments of the

function of the visual organs, though the degree is slight, are having an adverse effect on the procedure of classification and selection.

The second most common reasons for limited fitness consist of deformities of the system of bones and muscles (curvature of the spine, flat feet, etc.). These impairments are represented to an approximately equal extent in urban and rural environments (6.0:6.7 pro mille).

However, hearing impairments are far more common as a cause of limited fitness in urban than in rural environments, and this is unquestionably the consequence of the high noise level in large cities (6.4:3.0).

c) Causes of Unfitness for Military Service

The term "causes of unfitness for military service" refers to all consequences as illness, injuries, acquired or congenital anomalies and deformities making a recruit unfit for military service, whether his unfitness be permanent or only in peacetime. In the case of an illness which is still active or some condition which is not definitive (underdevelopment), the official classification is temporary unfitness.

Illnesses and more serious impairments of the eye take first place among causes of unfitness of recruits for military service. Here again we are dealing mainly with anomalies in refraction and also the consequences of serious illness or injury causing complete blindness or considerable reduction of vision. Once again the incidence is considerably higher in urban than in rural environments (14.6:10.8 pro mille).

It is interesting to mention that these illnesses were not so frequent 7 or 8 years ago. One reason for this change is better diagnosis in induction centers, but there also has been an actual increase of these illnesses and injuries, especially among young people in the city, and this is related to the very rapid rate of urbanization and the fact that appropriate preventive measures have not been taken.

A certain number of draftees, and there will be more and more of them, have serious deformities of the bone and muscle system, and this group of illnesses is in the second place on the list (flat feet, X and O curvatures of the spine, curvatures of the legs, etc.). Numerous studies in Yugoslavia have established that there are more and more of these deformities in urban environments (10.8:9.2 pro mille), and they usually occur in the periods of most intensive growth in height (between the ages of 9 and 16), unless, of course, the timely preventive and corrective measures are taken. On the one hand we have all the preconditions for more rapid morphological development (acceleration), a higher general standard of living and better diet, above all from the quantitative standpoint. On the other hand neither the family nor society are able to offer the complete "functional superstructure" for the growing young organism. One contributing factor is the effect of various fads (slimness), but there is also the increasing frequency of users of drugs and alcohol among young people, which are tending more

and more to deteriorate the diet, which, accompanied by insufficient physical activity, results in complete physical and mental disability.

Third place is taken by diseases that fall in the group of mental disturbances, which are also more common in urban than in rural environments (9.5:6.5 pro mille). Since great progress has been made in the prevention of endemic goiter, which accounted for a large number of mentally retarded persons in this group, its relatively "high placement" should be attributed in large part to accelerated urbanization and contamination of the social environment. We are now somewhat more successful in detecting these disturbances in draftees, since induction centers conduct not only medical examinations (including interviews with specialists in neuropsychiatry), but are also conducting detailed psychological tests, which help to discover even the less severe forms of disturbances of the structure of the personality.

Ailments of the auditory organs, the throat and nose are in fourth place on the list, and here chronic inflammations of the middle ear have the highest share. These are conditions representing consequences, mainly of improperly treated acute inflammations of the middle ear where primary health care is inadequately developed, and this is still a problem in the economically underdeveloped regions. That is why the morbidity in rural environments is slightly higher for this group of diseases than in urban settlements (7.7:5.7 pro mille). This group also includes serious impairments of hearing (complete deafness in one or both ears), which are more frequent in urban environments as a consequence of acoustic trauma.

The group consisting of diseases of the cardiovascular system is in fifth place among causes of unfitness for military service. These are mainly heart defects both congenital and acquired, and then there are more and more cases of juvenile hypertension and also definitive conditions following inflammation of the cardiac muscle and the like. Here we see the impact of the environment in an excessive accumulation of population with low standard of housing because of the rapid urbanization of the large cities, making possible the constant presence of acute and chronic illnesses of the upper respiratory tracts (sore throats and tonsillopharyngitis), which in turn opens the door to pathogens causing inflammations of the valves and muscle of the heart. A large portion of these acute cardiac illnesses result in defects in cardiac function and disability. If we add to this that the urban population in this case is "new," not familiar with the laws governing the spread of disease in densely populated environments (low level of health education), then the consequences are clear. It is therefore understandable that rheumatic fever (a very good generator of heart defects) is still maintaining itself, precisely in those overpopulated urban environments where we should add the relatively low level of health education of the population to the low standard of living and inadequate health care. For all these reasons these diseases have a considerably higher incidence in urban than in rural environments (8.1:4.9 pro mille).

Illnesses and disturbances of the peripheral nervous system are in sixth place on the list. They are also increasing steadily and result from transient acute illnesses or the "traumatic epidemic" which is leaving increasingly frequent and serious lasting consequences, and these are more frequent in urban than in rural environments (6.4:3.4 pro mille).

Diseases of the digestive organs are in seventh place on the list and are becoming more and more important among the illnesses discovered at the time of induction. It is well known that certain forms of these diseases (gastric and duodenal ulcer) signify unfitness for military service in peacetime. Now that induction centers have been set up and recruits are examined more thoroughly, and health service in the field is better organized, more and more of these young men are being detected among recruits. By and large they come from large urban environments, and the increasingly frequent occurrence of ulcers can and must be attributed to the rapid rate of urbanization and the altered way of life in general (increased stressogenic factors). These illnesses are markedly more common in urban than in rural environments (10.3:2.2 pro mille).

It follows from the results we have obtained that morbidity for all these basic groups of diseases representing causes of unfitness for military service, except for diseases of the ear, is higher in urban than in rural settlements, and we can therefore conclude that one of the reasons for this is the impact of factors of the urban environment, which in every respect is more polluted and degraded than settlements of the rural type.

d) Causes of Temporary Unfitness

When we turn to those who are temporarily unfit for military service, we should emphasize that these are diseases and other disturbances which are not definitive and in which one can expect an improvement in a few years, and the inductee is classified as unfit for that period.

This category of inductees shows the highest morbidity in the group "symptoms and unclear conditions" (in Yugoslavia as a whole) at 29.2 pro mille, the morbidity being considerably higher (41.9 pro mille), in urban settlements and in rural settlements slightly lower (20.4 pro mille) than the Yugoslav average. Here we are usually talking about underdevelopment and undernourishment, but also the consequences of some acute illness which has just been suffered. We believe that the indicators of the low standard of living (the general standard, housing, diet, education, etc.) should be included in the broad conception of the negative impact of the human environment. These factors do indeed have an impact on the growth and development of young men, which means that they affect the assessment of fitness for military service.

Within this group our attention is drawn to the steady increase in the number of those classified as temporarily unfit because of positive findings in the urine. Several years later, when fitness is again evaluated, chronic nephritis is found in quite a few of these recruits. It is still not quite

clear why nephritis is an endemic phenomenon in Yugoslavia, but it is a fact that the environment, and most probably pollution of groundwater, has a certain effect.

Mental illnesses and diseases of the nervous system are in second place among causes of temporary unfitness of recruits, but the share is far lower: 3.7 pro mille in Yugoslavia, 6.2 pro mille in urban environments and only 0.7 pro mille in rural environments.

The category of diseases of the heart and blood vessels is in third place with a morbidity rate of 3.4 pro mille. This category includes the milder conditions of hypertension and neurocirculatory dystonias, which are more and more frequent among our young men in the city, but are less common in rural areas (5.7:3.1 pro mille).

We can note with satisfaction the steady decline in cases of tuberculosis, which for many years headed the list of causes of temporary unfitness for military service. However, we are disturbed by the pronounced growth tendency of the morbidity rate, which at the moment is not high, of other infectious diseases and diseases of the respiratory system, where asthma and chronic bronchitis take the lead. There is no question that we are certainly dealing with the adverse effect of the contaminated environment in the cities, since these illnesses are considerably more frequent there than in the hilly and mountain rural areas.

e) Medical Reasons for Discharging Soldiers From the YPA Before They Have Served Their Term of Military Service (Unfit and Temporarily Unfit)

It is well known that unfitness for serving a period of military service may occur in any year of the recruit's age, and consequently may also occur during his term of service (illness and injuries). However, it is a fact that two-thirds of the soldiers discharged from the armed forces before completing their period of military service as unfit for service in the YPA belong to the category referred to as "ill or injured before induction into the YPA." Since the morbidity rate and rate of incapacity are specific in the armed forces, more attention will be paid here to those who are discharged from the YPA because of illness or injuries which they had before induction into the YPA. The essential point is that certain illnesses or disturbances cannot be detected even with the most detailed examinations in an induction center, since they are "invisible" unless the inductee cooperates with physicians (gastric ulcer for example). Other illnesses and disturbances become manifested only if the recruit is examined and assessed as an individual in the military unit (mental disturbances). A third group is made up of those illnesses or disturbances which we assume are those that account for low or limited performance of the duties in the YPA. In other words, these are conditions that were noted, but were underestimated. The most common cause of discharge before completion of the period of military service is mental disturbance. Here there are two subgroups. One consists of so-called oligophrenias (intellectually and emotionally retarded), which were noted at the time of induction, but it was assumed that

the soldiers would still be able to cope with instruction and training. These soldiers come from both rural and urban environments as a function of the spread of oligophrenia.

The second subgroup consists of psychopathies and psychoneuroses which are more common in the population coming from cities or their immediate vicinity. As a rule these are young men who grew up and matured in a socially unwholesome urban environment (children of divorced parents, juvenile delinquents, alcoholics, drug addicts, etc.).

Second place is taken by ailments of the digestive system, above all duodenal or gastric ulcer. According to our findings, these illnesses are more frequent in the urban than in the rural population. The same remarks also apply to the other groups of diseases as a reason for discharge from the YPA before completion of military service.

f) Reasons for a State of Health of Soldiers Which Is Unsatisfactory in the Opinion of Their Immediately Superior Officers

In assessing the state of health of all their men the immediately superior officers also made a judgment as to the causes of the unsatisfactory state of health of the soldiers they put in these categories.

It is interesting that the officers also put in first place visual impairments and then disturbances of the system of bones and muscles, and mental disturbances. It is also worthy of note that the unsatisfactory state of health is again more common among soldiers coming from an urban environment.

Capabilities of the New Induction System for Future Study and Monitoring the Impact of the Environment on the State of Health of Young Men

The new system of induction based on induction centers, which are institutions specialized in induction (classification and selection of draftees), has created the preconditions for this problem area to be monitored and studied by the scientific methods recognized in the world. A large number of important data are gathered about every inductee when he is processed in the induction centers and as he passes through the dozen or so rooms and laboratories representing different specialties and the many stations within them. An automatic system for processing these data also is being developed; in addition to meeting the needs of the induction system, this will also make it possible to examine all the principal characteristics of the military manpower pool. The system for processing recruits in induction centers was so conceived that the evaluation of fitness is made on the basis of a rating of health, a rating of the organs and systems relevant to assessment of fitness for military service, the results of psychological tests, anthropometry and functional tests, etc. It is not hard to see that on the basis of all these data one can obtain a number of correlations to meet the needs of analysts of various specific problems. Within this context it is also certain that the study of the impact of the environment on the state of health of young men can be put on a far broader and more

reliable basis, and this will make it possible for us not only to examine the consequences of the adverse impact of the environment, but also to detect the causes of that situation.

Conclusions

1. In view of all the characteristics which are recorded and studied, inductees can be taken as representatives of certain phenomena and trends in our population as a whole and especially among young men. This is particularly evident in growth and development, state of health, physical and functional characteristics, etc.

2. The assessment of fitness for military service depends on the inductee's state of health, but the percentage of inductees found fit and of all other categories is also affected by the criteria used in assessing fitness. The percentage of those found fit in our country has been steadily increasing thanks to improvement of the people's state of health, but also because the criteria used in assessing fitness have been brought into conformity with the conception of nationwide defense.

3. Over the last 14 years there have been essential changes in the correlation between the percentage of recruits found fit and the opstinas where they have their permanent residence. As a rule and almost without exception the more advanced urban environment, and especially the opstinas representing the large republic capitals, had a lower position on the list in 1974 than in 1962. On the other hand, opstinas which have primarily rural characteristics have improved their ranking over the same interval.

4. Most important in the morbidity of inductees with limited fitness for military service are diseases and functional impairments of the visual organs, anomalies in refraction being the most dominant, deformities of the muscular and bone system, hearing impairments, illnesses of the cardiovascular system, etc.

5. First place among reasons for "unfitness" for military service are diseases and functional impairments of the visual organs and of the muscle and bone system, and then mental disturbances, which are followed by diseases of the ear, heart and blood vessels, and so on.

6. Most frequently represented among reasons for temporary unfitness are diseases and conditions which in the international classification make up the group referred to as "symptoms and unclear conditions." In our recruits these consist of underdevelopment and undernourishment, conditions following acute diseases with the definitive consequences still unclear.

7. The dominant role among reasons for discharge of recruits from the YPA before completion of their military service as unfit or temporarily unfit is played by mental illness, and then diseases of the digestive organs, diseases of the circulatory system, and so on.

8. In the judgment of immediately superior officers, men in units of the YPA are unsatisfactory in their state of health for the following reasons: impairments of vision, ailments of the muscle and bone system, and mental disturbances.

9. All these groups of illnesses, disturbances, physical injuries and impairments which have a leading role in assessment of fitness for military service are more pronounced in men coming from urban environments than in those coming from rural settlements, which is directly or indirectly an effect of the environment in which the recruit lives and works.

10. The new induction system based on induction centers has created all the conditions for a more comprehensive and scientific approach to studying this problem area.

7045
CSO: 2800

INDUSTRY MAIN CAUSE OF POLLUTION

Teheran TEHRAN JOURNAL in English 15 Nov 77 p 3

[Text]

TEHRAN — Industrial wastes cause far more pollution than vehicles in the capital, an environment expert studying the problem here said yesterday.

Speaking on NIRT's international radio program Woman's World yesterday, Douglas Caldwell said pollution from southern industrial sites was carried north by prevailing winds and trapped there by surrounding mountains.

He cited the increasing demand for cement and bricks to satisfy construction requirements as one reason for severe industrial pollution.

Urging that industrial pollution be dealt with before tackling the problem of exhaust emissions from the city's 1.5 million vehicles, Caldwell said efforts to reduce traffic congestion would help to alleviate exhaust pollution.

The level of atmospheric dust in northern business areas was three times higher than acceptable levels in the US and was "nearing the alarm figure" in southern Tehran.

Other problems resulted from inefficient heating systems and constant rubbish burning. On a more encouraging note, Caldwell said Tehran dust did not seem to contain substances which caused cancer and other diseases, and for reasons he had yet to discover, smog had not formed in the city despite the presence of conducive materials.

Caldwell also suggested a monorail system for north Tehran as one way to help residents escape pollution resulting from present road congestion.

CSO: 5000

SOVIET-AMERICAN SYMPOSIUM ON ENVIRONMENTAL PROTECTION

Yerevan KOMMUNIST in Russian 19 Oct 77 p 3

[Text] The work of the Soviet-American symposium "Economic Aspects of Environmental Protection" began in Tsakhkadzor on 18 October.

In opening the symposium the cochairman of the joint Soviet-American commission on environmental protection, head of the USSR Glavgidrometsluzhba [Main Administration of the Hydrometeorological Service at the Council of Ministers], vice-president of the World Meteorological Organization and corresponding member of the USSR Academy of Sciences, Yu. A. Izrael' noted that the work of the symposium is in progress on the threshold of the 60th Anniversary of the Great October and literally several days after the adoption of the new constitution of the Soviet Union which, in the region of legislation, showed the relationship of the people to the environment for the first time in the world.

Our work is of great importance not only in a scientific respect but also in the plan of closer cooperation between our countries in this area. Soviet and American specialists on planning, standards, ecology and geophysics, and workers in industry are participating in the symposium.

The drive for environmental protection requires not general words but practical actions and discussions, and in these terms we are confident that the results of the symposium will be encouraging.

The deputy chairman of the Armenian Council of Ministers, G. A. Ayrapetyan, in welcoming the symposium participants in the name of the republic government observed that questions of environmental protection are a current worry for all states in the world, including the Soviet Union and the United States. Specific work in this direction is also in progress in our republic.

The government of the Armenian SSP has formulated a number of measures which define ways to eliminate the existing and prevent possible pollution of objects in nature. Recently there was a discussion of the measures to protect and make efficient use of the natural resources of Lake Sevan.

The Tenth Five-Year Plan has scheduled a number of measures for protection of nature. Over 600 million rubles have been allotted for environmental protection and efficient use of natural resources.

The republic has made definite progress in perfecting the settlement system, and in improving the planning and public welfare of cities and residences with consideration for the local natural and climate conditions. A "General Plan for Landscape Organization of the City of Yerevan" has been compiled with consideration for environmental protection.

The head of the American delegation, deputy assistant secretary for environmental affairs of the U.S. Department of Commerce, Dr Sidney R. Galler expressed appreciation for the warm wishes and cordial reception given to them in Armenia.

If the people of our planet, he said, want nature always to be intact, then we, the representatives of the largest states in the world, must conduct fruitful and joint work in this area. Within this symposium we can solve the important problems facing us.

In his speech the advisor for economic affairs of the U.S. embassy in the USSR, [Kenneth Skoug], observed that the nature surrounding us is unique and that the participants in the symposium must solve the problems facing them.

The head of the technical administration of the USSR Gosstandart, B. N. Lyamin stated that in the area of standardization the joint work has been underway since 1974 and, despite the short time, has already made specific progress.

9035
CSO: 5000

SCIENTIFIC COUNCIL SESSION: MAN AND THE BIOSPHERE

Vil'nyus SOVETSKAYA LITVA in Russian 1 Oct 77 p 1

[Article: Man and the Biosphere]

[Text] Today ended the out-of-town session of the Scientific Council on Problems of the Biosphere of the USSR Academy of Sciences which discussed such topics as the study and efficient use of natural resources, protection and prediction of the development of the natural environment in the Baltic region and the Baltic Sea.

The opening speech at the session was given by the vice-president of the Academy of Sciences, Lithuanian Soviet Socialist Republic, A. Zhukauskas. In their reports the vice-president of the USSR Academy of Sciences, A. Sidorenko, academician and secretary of the Department of Chemical, Technical and Biological Sciences of the Lithuanian SSR Academy of Sciences, L. Kayryukshtis, and famous scientists of Latvia and Estonia gave information on the research and protection of the natural environment both in the country as a whole and in individual union republics.

The speakers and participants in the discussions noted that measures are being taken in the USSR in the interests of present and future generations for the protection and scientifically justified efficient use of the earth's mineral resources, the plant and animal world, purity of the air and waters, guarantee of reproduction of native resources and improvement of the environment.

It was noted that specific experience in this area has been accumulated in Lithuania. Thus, the Academy of Sciences of the republic together with other organizations in accordance with the international program recently drew up the republic program "Man and the Biosphere." It is an integral part of the all-union program. Considerable attention is also focused on this problem in Latvia and Estonia. In recent years in all the republics of this region, work has developed which is related to the study of and protection of the Baltic Sea.

The session participants visited the Baltic beach, the Kurshsk sand bar, the Kaunas reservoir and other sites.

The session adopted a resolution directed towards further perfection of the program "Man and the Biosphere."

Academician and secretary of the Department of Oceanology, Physics of the Atmosphere and Geography of the USSR Academy of Sciences, L. Brekhovskikh, directors from the institutes of the all-union academy, other scientists and specialists participated in the work of the session.

The session participants--the vice-president of the USSR Academy of Sciences, A. Sidorenko, and other leading scientists were received by the first secretary of the Central Committee of the Lithuanian Communist Party, P. Grishkyavichus. Present at the reception were the secretary of the Lithuanian Communist Party Central Committee, L. Shepetis, the president of the Lithuanian SSR Academy of Sciences, Yu. Matulis, and vice-president of the academy, A. Zhakauskas. During the conversation the scientists talked about the studies in progress on protection of the natural environment and more extensive use of its resources for the good of the Soviet people.

The scientists were also received by the chairman of the Lithuanian SSR Council of Ministers, I. Manyushis.

In conversation with the EL'TA correspondent the vice-president of the All-Union Academy of Sciences, A. Sidorenko stated: "The Vil'nyus meeting of scientists revealed that research of the natural environment in the Baltic region is being conducted on a high scientific level. We also ascertained for ourselves what tremendous work is underway on the threshold of the 60th anniversary of the Great October and the adoption of a new USSR Constitution in the republic to implement the resolutions of the 25th CPSU Congress. The experience which the scientists of the Baltic region accumulated will also serve other fraternal republics.

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PROTECTING LENINGRAD'S AIR BASIN

Moscow PRAVDA in Russian 19 Oct 77 p 6

[Article by V. Senin, correspondent of PRAVDA: "Clean Air over the City"]

> [Text] A general plan for improving the condition of Leningrad's air basin has been compiled. It will be an integral part of the general construction plan for the city, programs for its economic and social development. The set of measures envisaged by the general plan will reduce discharges into the atmosphere by 5-6 times.

The plan is the result of a joint search by specialists and scientists of the LenNIIproyekt, as well as the administrations of the Gidrometsluzhba [Main Administration of the Hydrometeorological Service of the USSR Council of Ministers], GAI [City Automobile Inspection], the sanitary inspection, A. I. Voyeykov Main Geophysical Observatory, and a number of research, planning, and public health organizations. All spheres of the municipal economy were encompassed--factories and plants, power plants and motor transport. A careful investigation was made of each region and sources of air pollution were found. Based on the findings the appropriate recommendations were made.

Great attention is focused on industry. Discharge of dust, sulfur dioxide, carbon monoxide, ash and cinders--all of this not only impoverishes nature but can affect the health of man as well. Many Leningrad enterprises are already moving outside the city into nonresidential zones. Technological processes are being perfected, and sometimes the profile of a certain enterprise is changed.

As just one example: a coke gas plant was smoking for many years. Production was stopped and redesigned. Now the enterprise specializes in the output of metal-cutting tools and items made of metal ceramics.

At the major plants the obsolete technology is subject to replacement; gas-purifying and dust collecting devices are being built. It is planned

to introduce new methods of purifying flue gases from undesirable discharges. There are plans for an automated system which will permit tracking of the purity in the air basin of the city on the Nega.

Proposals have been made for the central heating and power plants. It has been recommended to advance more boldly in introducing nuclear fuel and to construct nuclear stations. Their use will permit the saving of an enormous amount of organic fuel and at the same time reduce atmospheric pollution.

Transportation problems occupy a large place in the general plan. Analysis has shown that many motor vehicles are used incorrectly and their motors are poorly tuned. The prbblem of reducing the hazard of exhaust acquires primary importance. The "breathing" of the motors must become clean. New types of carburetors with electronic control of the injection systems have been developed and are being tested. As experiment has shown, during their use the content of carbon monoxide in the exhaust is reduced 2-3 times. The network of high-speed roads and expressways is expanding. This means that the stopping of motor vehicles at intersections is drastically reduced. Moreover the motors will be more uniformly loaded. In the auto services of the city, work has begun on improving the servicing and tuning of the fuel apparatus in the motor vehicles. The employees in the state auto inspection have been commissioned to stop and punish drivers not only for reckless driving or violation of traffic laws but also for a poorly cooled motor.

"We will convert a number of cars to liquefied gas," stated the chief engineer of the general plan, V. L. Shiffers. "Electric cars and buses will also appear on the streets. This type of transportation is now being tested."

Serious attention is paid to the "oxygen factories"--greenery. In the future, parks, squares and avenues of the city will be expanded so that each citizen of Leningrad will have up to 18 square meters of greenery. Sanitary protective sections are being formed around industrial complexes. The area of enterprises is being decorated with gardens and avenues.

The forest and park belt of Leningrad has been called upon to play an essential role--its formation will be definitely completed. Oak woods groves and pine forests of the suburbs are being joined with the green areas of the Leningrad sections.

The implementation of the set of measures envisaged in the general plan will permit a considerable reduction in the atmospheric discharges. The air over the city will become cleaner and clearer.

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MECHANIZATION OF CONSTRUCTION AND CONTROLLING POLLUTION DISCUSSED

Moscow MEKHANIZATSIYA STROITEL'STVA in Russian No 8, Aug 77 pp 10-11

[Article by S.S. Atayev, doctor of technical sciences, Belorussian Polytechnical Institute, and V.I. Polyakov, candidate of technical sciences, TsNIIOMTP [Central Scientific Research Institute of Organization and Mechanization of Technological Processes]: "Mechanization of Construction and the Problem of Preserving the Environment and Protecting Mankind"]

[Text] The problem of preserving the environment and protecting mankind from the harmful effect of phenomena occurring in the process of construction has become more and more urgent. The fact is that mechanization of construction, being an undisputable factor in technological progress, under certain unfavorable conditions displays a negative effect on the physical and mental state of workers. The effects of noise, gas contamination, dust, vibration, and high and low temperatures can be the cause of cardiovascular diseases, impairment of the central nervous system and of hearing, poisoning, etc.

The significance of this problem is increasing on account of the following specific aspects of advances in construction and mechanized technics:

An increase in the machine-worker and power-worker ratios in construction and an increase in the number of machines equipped with internal combustion engines.

A steady increase in the pace of construction and installation work and a reduction in the time required for erecting buildings and structures, which invariably involves intensification of transportation of construction loads and machinery.

A high percentage of small-size, spread-out construction involving frequent relocation of building equipment.

A considerable amount of building work involving reconstruction and modernization of existing enterprises, as well as urban renewal in large cities and settlements.

Intensification of work processes and operations, responsible for increasing the duty of machinery and raising speed ratings.

At the current time the country's building organizations have an inventory of about one million machines and almost one and one half million mechanized tools.

The growth of the degree of mechanization of construction and the machine-worker ratio is illustrated by the following individual figures.

In the period from 1961 to 1973 the degree of mechanization of construction increased by a factor of 1.75 and the machine-worker ratio almost twofold; the number of key building machines per 100 workers increased by a factor of 1.25 to 2.5; the power-worker ratio from using hand machines will reach 0.4 kW per worker by 1980, according to intentions.

During this period there has been a considerable change in personnel structure. A great number of construction workers are employed in just operating building machines and servicing them. The percentage of workers employed in operating building equipment has reached 20 percent. Protection of this category of workers, as well as of other workers taking part in building work in direct proximity to machines, from the harmful effect of the production milieu is of great importance from the medical, sociological, and technological points of view. Reducing levels of vibration, noise, and gas contamination must be considered one of the foremost problems.

With the prolonged effect of noise higher than 85 dB on a human being, noise exhaustion takes place, and noise of 120 dB causes serious, sometimes irreversible, disease symptoms. The following are the main sources of noise at the current time whose level in a number of instances exceeds tolerances set by health standards (85 dB): diesel power units on wheelbase chassis (motor vehicles, towing vehicles, and tractors) and on construction machines, as well as piledriving equipment, whose noise level can reach 100 dB when operating; stonecrushing equipment (100 to 125 dB); vibrating tables for making ferroconcrete items (100 to 115 dB); excavators with 0.65- to 1-m^3 buckets and multibucket excavators (85 to 100 dB); compressors (100 to 120 dB); bulldozers (92 to 110 dB); road scrapers on wheel-type tractors and towing vehicles (110 to 117 dB); and a number of other machines.

Among hand machines, especially high noise is created by drills, pick hammers, vibrating rammers, concrete breakers, saws when cutting metal, and some riveting and chiseling hammers.

The campaign against the effects of noise should be conducted according to the following main guidelines:

Employing new production processes and methods of mechanization which eliminate or drastically reduce noise.

Developing new designs of internal combustion engines with low noise levels.

Establishing modes of operation for machinery whereby elevated noise levels are tolerated for brief periods of time.

Sound-proofing the cab has a positive effect in many construction machines. A lot of work remains to be done in the area of sound-proofing and reducing the noise level of the power unit.

Mention should be made of the fact that on the worldwide level there have already been specific examples of manufacturing construction machines (bulldozers) with power units having reduced noise characteristics.

An example of a change in a traditional production process is the assembly line for making ferroconcrete slabs developed by specialists of Minpromstroy BSSR [Belorussian SSR Ministry of the Construction Industry], where the vibrating action on the item being molded has been replaced by injecting the concrete mixture into the enclosed cavities of the mold while at the same time exerting hydrostatic pressure and utilizing vacuum compaction. In this way it has been possible to reduce the effect of noise on operating personnel to acceptable limits.

Positive results have been achieved by replacing diesel-driven hammer pile drivers with equipment with a vibrating and vibrating-and-ramming action, as well as by using units for burning out holes, by using for loosening up frozen ground hydraulic hammers and jib-type machines instead of cleat-and-ball-type hammers suspended from excavators, and by changing the procedure for working frozen ground by preventing it from freezing by means of units for applying to the surface a protective layer of non-thermoconductive foaming materials ("Penoled," etc.).

To trap the effect of noise and vibration on the operator, TsNIIOMTP and VNIISMI [All-Union Scientific Research Institute of Construction Machines and Tools] have worked out work routines for hand machines according to which the total length of time they are on, depending on the type of machine and its purpose, amounts to 0.12 to 0.2 times the work time for the shift. Intermittent duty for hand machines makes it possible to reduce the effects of noise and vibration on a human being.

At the present time Minstroydormash [Ministry of Construction, Road, and Municipal Machine Building] is manufacturing about 96 percent of all hand machines in a vibration-safe design. As a preventive measure, for riveting and chiseling hammers a maximum period of operation not exceeding one hour per shift has been adopted, according to the health standards of SN 1102-74 and Instructions for Safety Procedures. Industrialization and the increased degree of mechanization of construction have resulted in a considerable increase in the volume of load transportation, and, consequently, in intensification of truck and mobile building machine traffic. Consequently the air

is becoming polluted with diesel exhaust components and natural oxygen is being burned up (one motor vehicle in two days of operation absorbs the same amount of oxygen consumed by a single human being in an entire year). Pollution of the air also occurs within the active zone of influence of machines and transportation equipment, especially under crowded conditions, in built-up areas, among erected sites, or in foundation pits, when the concentration of harmful substances contained in exhaust gases (for carbon monoxide) can exceed the permissible norm of 20 kg-f/m^3. Numbered among measures aimed at reducing gas pollution of the environment should be shortening the distance for transporting construction loads and building equipment by selecting efficient routes, properly locating production centers and mechanization centers, and expanding the amount of containerization and packaging, which will result in the end in reducing noise and chemical pollution.

For example, putting an ASU [automated control system] into operation for transporting concrete mixtures and mortar from manufacturing plants to customers' sites in the Belorussian SSR will make it possible to reduce the amount of haulage of this product by as much as 30 percent.

Research conducted at TsNIIOMTP on developing a standard assortment of motor vehicle transporation equipment and on creating special-purpose equipment for transporting different building loads and structural elements has been aimed toward reducing type sizes and to making fullest utilization of the load-carrying capacity of machines, and finally to reducing the required number of machines.

The campaign to reduce gas pollution of work places near operating machines is still not being waged actively enough. Here key measures should be aimed at speeding up creation of new power units using the following:

Engines with cleaner exhaust, in which installation of special added devices has been provided for (afterburners, catalyzers, etc.).

Engines operating on hydrogen gas or hydrogenated fuel.

Gas turbine engines.

Adoption of advanced engines in industry will make it possible to develop improved drives for building machines. Introducing electric and diesel-electric drives within technically justified limits and the ability to draw off exhaust gases beyond the machine's working area are also making it possible to reduce gas pollution.

Special attention must be devoted to the performance of fuel-system equipment, to fuel quality, and to skills of drivers and machine operators, for the purpose of maintaining the permissible gas pollution level.

When using building machines in installation, loading-and-unloading, and storage areas and at fuel and lubricating material dumps, the soil becomes

polluted with exhaust products, as well as because of leaks of operating liquids and fuel. This situation disturbs the natural structure of the soil in building regions and at mechanization centers.

The increase in the volume of construction, as well as the spread of open-cast coal mines and fields and of vast surface mines, are being accompanied by destruction and loss of the cultivated layer of soil. Availability of heavy-duty building equipment making it possible to cut off the ground layer by layer makes it possible to recultivate it at mined-out areas or when the soil has been impoverished, just as was done during construction of the Starooskol'skiy Electrometallurgical Combine and at the surface mines in the Ukraine.

The working conditions of machine operators in the northern and southern regions of the country are examples of the effect of the environment on the human being. In machines designed for use in cold areas provision has been made to create a microclimate in the cab with an outside air temperature of down to minus 50 to 60°C. But the number of these machines is no higher than two to six percent of the total number manufactured, which cannot affect altering the working conditions of workers throughout the entire machinery fleet.

When using building machines of the ordinary design with mechanical and hydraulic drives, under extreme conditions of outside air temperature of from -35 to -50°C without appropriate heat insulation, and in view of the absence of mass-produced heaters of the in-the-cab type, it is not possible to maintain the temperature at the level of current norms. When machines of the ordinary design operate in southern regions, the temperature in the cab reaches 40 to 42°C, which is seven to nine degrees above tolerance. The cab's seal as a rule proves to be insufficient for preventing dust from coming in. A possible effective solution is to create special machines furnished with air conditioners, as well as to develop operating routines with provision for breaks at the hottest time of the day.

In northern and southern regions, especially during the building period, the soil and water become polluted with domestic and industrial waste material. The limited water basin of rivers and lakes in these regions can not act as routes for drainage and active self-cleansing. For this reason it becomes necessary to develop and make mobile sanitary engineering plants for temporary storage, decontamination, and subsequent processing and elimination of waste.

In the north an important problem is to prevent formation and development of thermal karst foci (hillocks, karst holes, swells) which occur in particular when building machines and transport vehicles, especially those with caterpillar drives, move over ground areas and roads. In this regard creation of air-cushion machines and development of air transportation and erection vehicles are of urgent importance.

At the current time not only special-purpose institutes, but also many international organizations (CEMA, ISO, MOT, etc.) are involved with problems of protecting the environment and mankind. A UN environmental program has been created (UNEP). The interrelationship between construction, its industrialization and mechanization, and the environment was the subject of consideration and discussion at the fifth seminar on the building industry of the Committee on the Housing Problem, Construction, and City Planning of the European Economic Commission in Budapest on 8 Oct 76.

Some preliminary suggestions can be made, based on accumulated domestic know-how and foreign data in connection with the interaction between machine equipment and the environment.

Taking into account the fact that the main sources of noise and gas pollution are internal combustion engines, it is necessary to concentrate the attention of engine builders on developing designs and measures which will guarantee obtaining the permissible values of these ratings.

Recommendations must be made to building process and machine building institutes to widen research aimed at reducing the harmful effects of building equipment on the environment and mankind.

It is thought to be advisable to develop unified ergonomic standards for noise, gas pollution, and vibration in member countries of CEMA, and later on the all-Europe scale.

There should be stricter requirements in evaluating technological level and quality and in certifying building machines, mechanized tools, and transport vehicles from the viewpoint of conformity of noise, vibration, and gas pollution levels to health standards.

Performance specifications should be developed for building machines and transport vehicles in connection with observing environmental gas pollution standards, and rules must be introduced for checking these standards before equipment goes onto the production line.

When operating building machines and transport vehicles wider use should be made of stationary mechanized units and fuel and oil refillers. Fuller application should be given to recovery of oil and power fluids and to utilization of cleaning materials.

With regard to the fact that many building machines are mounted on tractors, motor vehicles, and towing vehicles, it is necessary to increase the manufacturing quality of wheelbase chassis, making it possible for them to conform completely to health standards with regard to noise, vibration, and environmental gas pollution levels.

The considerable increase in capital investments for development of regions of Siberia, the Far East, and Central Asia has made it necessary to speed up

the solution to the problem of creating and expanding the output of building equipment, including special equipment, which conforms completely to the specific requirements for operation in the north and south and in mountain regions.

8831
CSO: 5000

ENVIRONMENTAL CONTROL MONITOR TO BE INTRODUCED

Moscow IZVESTIYA in Russian 11 Aug 77 p 6

[Article by E. Pasyutin: "The Atmosphere Under Control"]

[Text] The executive committee of the Moscow soviet has passed a decision about development and introduction in Moscow of our country's first automated system of observation and control over the state of the environment--ANKOS-A (avtomatizirovannaya sistema nablyudeniya i kontrolya za sostoyaniyem okruzhayushchey sreda--atmosfera).

By its every movement the modern industrial city "breathes out" into the atmpsphere a mass of different impurities. Daily, three times a day--in the morning, afternoon and evening--the Central High-Altitude Hydrometeorological Observatory, which has been placed in a light-colored house alongside the Ostankino television tower, receives information about Moscow's air from its centers. Regular samplings of the atmospheric air are taken in different regions of the city--in the center and on the outskirts, next to large enterprises and in residental areas, on lively main motor routes and in quiet rest zones. A determination is made of the content in the air of sulfur dioxide, carbon black, nitrogen oxides--these are the ejecta of enterprises, or carbon monoxide, which is given off by motor vehicles, and also dust. All this makesit possible to have a general picture of the status of the city's air basin.

"A qualitatively new stage in the work of the service for observation and control over the status of the atmosphere will be the creation of the country's first automated system--the ANKOS-A," states the manager of the Central High-Altitude Hydrometeorological Observatory, A. Britayev.

Just what is this system? Its bottom link is made up of automatic gas-analyzer stations. Their silvery boxes are appearing in various regions of the city. Around the clock at a given time the devices will take samples of the atmosphere and determine the content in it of different

impurities, and also meteorological values--temperature and humidity of the air, velocity and direction of the wind. Three dozen such automatic stations will operate in Moscow.

Information from the stations will go through channels of communication to the Center for Data Collection and Processing--construction of it will begin next year. The electronic computers installed in the center will "interrogate" the stations, process and analyze the obtained data and issue them in a form convenient for the users. This can be tables, maps of the condition of the environment and forecasting maps--short-term or long-term--not unlike the weather maps we all know. Such data are needed by the hydrometeorological service, industrial and scientific research organizations, medical and other institutions. In addition, mobile laboratories will be part of the system.

Participating in the development and creation of ANKOS-A are specialists from the Main Administration of the Hydrometeorological Service under the USSR Council of Ministers, the Main Geophysics Observatory, the Institute of Applied Geophysics, the USSR Ministry of Instrument Building, Means of Automation and Control Systems, and other organizations.

Beginning now is the construction of the first phase of the automated system. It is proposed that in the future the ANKOS-A (atmosphere) and the ANKOS-V (water), which has already begun operation on the Moscow river, will be joined in one system. Our capital will receive an effective service, efficiently following the purity of the air and the water.

10908
CSO: 5000

WORLD LEADER IN LAND AREA IRRIGATED WITH SEWAGE

Moscow KHIMIYA I ZHIZN' in Russian No 10, Oct 77 pp 98-100

[Article by V. M. Novikov, candidate of technical sciences, and E. Ye. Elik, candidate of chemical sciences]

[Text] Twelve million hectares of land at present are irrigated in the USSR; this is about four percent of our farmland, but it yields a fifth of all farm produce. Add to this the well-known fact that irrigating doubles harvest yields even in such a nonwater-short part of the country like the Nonchernozem Zone of the RSFSR, in fact, in years that were favorable in amount of precipitation.

In a book by K. V. Dolgopalov and Ye. F. Fedorov, "Voda--natsional'noye dostoyaniye" [Water: A National Treasure], we read that 142 million hectares is fit for irrigation in the USSR, but only 31 million hectares is supplied with irrigation water. Plainly, this tells us that water is in short supply. But nonetheless water is available, even a lot of it, but as waste discharges. Annually in our country 65 cubic kilometers of wastewater forms. So why not use even a part of it for irrigation?

Killing Four Rabbits With One Stone

Municipal wastewater has served in irrigation for already 200 years now. The first sewage farms were recorded in the 18th century in England--near Edinburgh, then in Ashburton and Devon. In 1857 a special commission was set up in London to study all then-known ways of purifying wastewater; the scientists concluded that dumping wastewater into rivers, even when purified, is dangerous; best of all is irrigating farmland with wastewater, then the rivers and lakes stay clean.

In Russia the first sewage farms were near Odessa (1887), then in Kiev (1894) and, finally, near Moscow--in 1898. At the close of the 19th century wastewater irrigated land areas in Germany, France, the United States, Australia, South Africa and India. Sewage farms are still found in these countries and others.

Today municipal wastewater, otherwise called domestic-economic sewage, receives mechanical, then biological purification. But even after this, the water cannot be let into the water supply network because it still carries high levels of harmful impurities: detergents, anions of acids, cations of metals and bacteria. But arable land can be irrigated with this water.

However, in recent years the situation changed because of water shortages: interest in using wastewater in irrigation--not only municipal, but industrial as well--has grown. It became obvious that solving this problem will mean, put figuratively, that four rabbits can be killed with one stone. Discharges will undergo final purification in soil; rational use will become possible for plants drawing on the nutrients discharges contain (nitrogen, phosphorus, potassium and trace elements); guaranteed high yields will be won from irrigated land; and, lastly, polluting rivers and lakes with these discharges will be avoided.

In the Moscow Area Settlement of Kupavna

In our country we are very serious about the problem of using wastewater in irrigation. So in 1973 the All-Union Scientific Research Institute for Agricultural Use of Wastewater (VNIISSV) was founded in the settlement of Kupavna, near Moscow. The institute is a ranking establishment, coordinating the activities of numerous organizations in the country engaged in the same problem. Also, the VNIISSV is part of the International Association on the Coordination of Scientific Research in Agricultural Academies of CEMA Member-Countries; it also carries out joint investigations with scientific establishments in the United States and France.

The VNIISSV determines whether given industrial discharges can be used in irrigation: this is a much more taxing problem than utilization of municipal sewage. Today it has been established that discharges from enterprises in the food industry (sugar, brewery and yeast plants) and also from some textile factories can be released into arable land.

Here is an example. In Kupavna stands a thin-cloth factory. It long dumped its wastes into the Kupavinka stream. At one time local residents frolicked on the river beaches, then swimming ceased; fish died out in the stream....

The factory's wastewater contains up to 80 mg/liter total nitrogen, 10 mg/liter P_2O_5, 12 mg/liter K_2O and 40 mg/liter CaO, along with detergents, dyes and others impurities. A preliminary check in the laboratory suggested this: the waste was still suitable for irrigation. Then field tests were begun.

A 50-hectare plot (the soils here are sandy-loam, sod-podzolic) was chosen near the enterprise. Then an irrigation system was constructed. Water from the factory after purification started entering the plot along a covered pipeline. The wastewater was evenly distributed over the whole field with flexible perforated capron hoses. Each hectare gets an average of about 5000 cubic meters of water yearly.

Crops growable on this land were chosen. Mostly these were perennial grasses: awnless bromegrass, timothy grass, meadow fescue and white clover. Since the factory wastes carry inadequate nutrients for plants, the plot has to be fertilized. The green mass yield in the plot was 400 to 500 quintals/hectare, two to three times more than without irrigation.

Toxicological analyses with laboratory animals confirmed that fully nutritious forage was grown in the irrigated field. The only necessity was the observance of specific sanitary-hygienic requirements, say, mowing the grass not earlier than two weeks after irrigation ended. Vitamin-enriched grass flour was then prepared from the mown grass. It was sent to the Noginskiy Sovkhoz.

Nowadays people are splashing again in Kupavinka....

From the Particular to the General

The experience gained in Kupavna is being extended to other textile factories. This problem is finding its solution in roughly the same way also in enterprises of the food industry.

The USSR leads the world in total area of arable land irrigated with wastewater (126,500 hectares). More than that, the world's largest irrigated plot was formed in our country. This is the Bortnicheskaya irrigation system outside Kiev; its size is 23,000 hectares; here biologically purified wastewater from the capital of the Ukrainian SSR are utilized.

About 20,000 feed units are grown in the farms of the RSFSR, the Ukraine, Lithuania and Latvia, per hectare of hayfields and pastures irrigated with wastewater; this is two to three times more than without irrigation; and 6000-7000 cubic meters of wastes are incidentally finally purified each year, per hectare. Many years' irrigation with wastewater has even boosted soil fertility. Before 1868 there was only lifeless sand outside Paris, where today we see sewage farms. Gradually, the land gained fertility. The same can be said about the fields in Lyuberetskiy Rayon close to Moscow, which have been irrigated with sewage since 1925, and the outskirts of Noginsk, irrigated since 1949.

Everything Is a Matter of Scale

Big animal husbandry complexes have come on the scene in our country; year by year their number is growing. Use of wastes issuing from cow barns and pigsties is an absolutely new problem (although our country and others have accumulated some experience in utilizing these wastes). It would seem that there would be nothing difficult here. Really, manure has been applied in fertilizing farm fields since time immemorial. Still, everything is a matter of scale. Never before did farms have to handle such a quantity of organic fertilizer. In 1975 the wastes from all the big animal husbandry farms of the country contained the following: 2.2 million tons nitrogen, 1 million ton phosphorus and 2 million tons potassium. And agriculture acutely needs these substances.

A hog-raising complex for 108,000 heads--using the hydraulic method of manure removal--supplies a million cubic meters of wastes a year. The concentration of nutrients for plants in these wastes is somewhat more than in industrial wastes: up to 5000 mg/liter nitrogen, 2500 mg/liter phosphorus and 2400 mg/ /liter potassium; the concentration is so high that, undiluted, the wastes can hurt the plants sooner than help them.

Though the problem of utilizing animal husbandry wastes still is not altogether solved, some possible variants of the solution are still at hand. We mention one variant, all the more so because it was already tested in practice.

Standing alongside the farm are the purification structures. In them, manure is first separated into liquid and solid fractions. The solid part is directed into gutters, where for 1.5-2 months the material is made nontoxic under the effects of the high temperature developed in bacterial growth. Then the manure is let out from the gutters into the fields, as usual.

The liquid fraction is diluted eight to ten times with water or municipal sewage and serves to irrigate farmland. The norms and periods of irrigation depend on the biological features of the crops raised and their needs in fertilizer and moisture.

The described method of utilizing animal husbandry wastes is employed in two Belgorodskaya Oblast kolkhozes. Corn and sugar beet yields nearly doubled. Approximate calculations showed that each hectare of irrigated land can provide forage for three cows. In comparison, we state that in the United States two hectares of pasturage are needed for the same three cows.

Wastewater is the inevitable waste from household and production activity of mankind. Its quantities will climb year by year. So many scientific and project-planning establishments in the country are busy with the problem of wastes utilization. It is difficult to tell all about this in a short article; this, in fact, was not what we set out to do. We wanted to have as many people as possible learn what is being done in this field and what are its potentialities.

10123
CSO: 5000

FIGHT AGAINST NOISE POLLUTION WAGED IN KIEV

Moscow LITERATURNAYA GAZETA in Russian No 37, 14 Sep 77 p 13

[Interview with V.A. Gusev, chairman of the Kiev city executive committee, by K. Grigor'yev, staff correspondent of LITERATURNAYA GAZETA: "Attack on Noise"]

[Text] One more problem of the times: how can it be solved?

We are sitting in the spacious office of the chairman of the Kiev city executive committee, Vladimir Alekseyevich Gusev. The solid building of the city soviet is located in the very center, on Kreshchatik street. The chairman's office is on the second floor. One window is open. Continuously carried in from the street is the noise of passenger cars, of trolley buses. And against this customary background of noise we are speaking about.. urban noise.

[Question] Correspondent: A fanous aircraft designer, our fellow townsman and your tennis partner Oleg Konstantinovich Antonov once coined the phrase that noise is information without any content.

[Answer] V.A. Gusev: Very witty.

[Question] Correspondent: But if only it were a matter just of the absence of information. Today's urban noise can even be included in the category of the illness of the century. Each of us, city dwellers, one way or another experience a certain noise pressure on ourselves. At times it is absolutely unbearable. Here is an excerpt from a letter to the editors of LITERATURNAYA GAZETA from a group of Kiev people who live on Shlikhter street: "Trucks drive past our windows day and night. And next to us, in the midst of the blocks of houses, a railroad passes. There is no rest from the rattle of the wheels, the sharp sound signals..."

[Answer] V.A. Gusev: This street in Darnitskiy Rayon is one of our worst spots. A month or two ago the situation on Shlikhter street was the subject of discussion at a session of the city's standing commission for combatting noise. Before 1 September proposals were to be worked out

for solution of the problem. I must remark with regret that this is not our only "noise-danger" street--there is also Bereznyaki, Brest-Litovskiy prospect, Gor'kiy and Shota Rustaveli streets...

[Question] Correspondent: What is being done in Kiev for acoustic well-being?

[Answer] V.A. Gusev: Before I answer the question specifically, let me try to scatter one opinion that has been formed: many people have gained the impression that the noise problem has arisen just now, in the era of the NTR [scientific and technical revolution ?], that it is exclusively an urban problem. But yet our remote ancestors did not like noise and fought against it, it must be recognized, whenever and wherever they could. In the countryside, not today's but the old one, 100 years ago, it would seem, what kind of noise could there be? Well, the hens cackle, the cows start lowing, the cock crows... No one was annoyed by these sounds, they were accepted as natural signals: "it is time to feed me, the cow," or, let us say, "it is time to get up." But, remember, what was the location then of the natural source of production noise in our present understanding--where did the village smithy stand? From the earliest times--on the outskirts, and without fail on the leeward side. So that it would not be heard. And in old Moscow, in the eve of market days, when there was a sharp increase in the carting of goods to market, did not they pile the bridges with straw? This was so that the thundering of the carts would not be heard. And the railroads were always set off to the side, and the trains were marshalled without fail on the outskirts. So man even in former times tried to avoid the noise. It is true that the noise was, as it is said, far from what it is today. And it was somewhat easier to combat the noise.

[Question] Correspondent: How should this battle be waged today?

[Answer] V.A. Gusev: There are many complexities. It is necessary to keep in mind that in the complex struggle against noise on the scale of a city it is waged differently in various regions.

One matter is the new residential areas. There it is a little easier for us, there the acoustic factor is taken into account today also during the planning of main roads, the construction of enterprises, the location of domestic services and so on. For instance, you will not encounter transport within the new Vinogradar' area. Motor bus traffic has been planned so that the stops are side by side, and the noise practically does not penetrate the apartments. Private cars also remain outside the area. Nor is there noise in the new regions from stores which are located on the first floors of the apartment buildings. We have resolved this question for new regions once and for all: here there are no built-in stores--we are building special buildings for trade.

Another matter is the old regions. Here everything is much more complicated. It is impossible to forget the scale of the destruction of Kiev

in the years of the past war. After liberation we were not thinking about noise, we were thinking about elementary covering over our heads. I will say further--the Kiev people were even gladdenedat that time by the noise of industry and construction projects, the noise of renovation. It is not unlike what Nekrasov said, you recall: "Rush-buzz Green Noise, Green Noise, spring noise!" And it is no secret that for many years the planners, builders and transport workers have thought least of all about the noise. But now it is necessary to change. Take out the enterprises. Move transport beyond the city limits. Prevent the emergence of new sources of noise. Prohibit the bringing of products to built-in stores at night. Have constant control over fulfillment of the resolution of the Ukrainian SSR Council of Ministers "On Measures for Reducing Noise at Industrial Enterprises, in Cities and Other Population Centers."

Practically we began several years ago when in the Kiyevproyekt [Kiev planning] Institute a special acoustics laboratory was set up which analyzed the acoustic situation in the city jointly with the Kiev Scientific Research Institute of General and Communal Hygiene. Physical measurements showed that 80 percent of all outside noises comes from main transport routes. A map was compiled of the levels of transport noise on the main streets.

Thus, the main noise scourge in the city is transport. Last year the state motor vehicle inspectorate examined about 170,000 different transport units. Almost 3,000 had faults which raised the noise level during movement. Right now a station for technical diagnostics of motor transport is being built with a handling capacity of 35,000 vehicles per year.

I will not talk about such generally recognized measures of lowering transport noise as the ban of truck passage in the center of the city, the conversion to one-way traffic and so on. We have even replaced the metal blades of the plows on snow-removal vehicles with blades made of rubber plates. More than half of the tram cars have been replaced by low-noise models, made in Czechoslovakia...

[Question] Correspondent: It is evident even from a superficial list what kind of serious work is being done. However it, it seems to me, is still staying in the framework of the ordinary tasks--road repair, replacement of old rail-cars and so on. Can you not name special technical developments or plans?

[Answer] V.A. Gusev: Plans have been worked out for more than 200 buildings in which special acoustical calculations have been made and variants of noise-abatement and noise-protection have been used. There are plans with the utilization of products from the new 134 series, where the shaft of an elevator is located in such a way that the penetration of elevator noise into a flat is excluded. On Borshchagovskaya street an experimental apartment building has been built where the windows have triple glazing--this lowers the noise by approximately 20 decibels.

It is possible to mention a whole series of other innovations, but I want to stress that we would not have attained anything in reducing noise if we had not relied on the latest technical developments. It is true that in this case we are also constantly coming up against different kinds of difficulties.

One more example. You mentioned the reader's letter from residents of Shlikhter street who are suffering from the railroad line of the Moscow-Kiev route which passes nearby. Still worse are the acoustical conditions for residents of a number of buildings on Brest-Litovsk prospect. We have studied this region in earnest. We have thoroughly studied all the innovationsof world practice. We have become acquainted with a very interesting variation developed in Paris. Supports are place along the railroad bed, and attached on them are reinforced concrete panel-shields with a grooved sound-repelling surface. They, as a mirror does to light, throw off the noise, removing approximately 30 A-decibels. Having decided to build such screens along Brest-Litovsk prospect and in Bereznyaky, at the end of 1975 we addressed this to the chief of the Southwestern Railroad, comrade Krivonos: we request consent to install at a certain distance from the roadbed the supports with sound-reflecting panels. After a certain time we received an official response: we are against it. But the residents continue to complain. Then I went to Moscow to the minister of railways, who was then comrade Beshchev. The minister did not express delight in connection with our request, remarking that no one had as yet addressed the railroad men with such matters, but he promised to transmit our plan to the technical administration. There it was soon also "killed." We, however, were not disturbed and continued to send well-reasoned letters to the ministry. This correspondence stretched out for months. It plagued us until the ministry sent all the materials to Kiev to the administration of YuZZhD [Southwestern Railroad] with which we had begun: they say, decide it yourself on the spot. We again began to put pressure on comrade Krivonos, and moreover we again attempted to insist that the railroad perform the construction of the screens: you make the noise, you should erect them. No, they responded to us, it is your affair, city business, you take care of them after you coordinate the plan with us. So there were agreements, and more and more new demands were advanced, and the planners made any concessions just to bring the matter to an end, and my deputy even resorted to a direct threat, declaring that from now on the city executive committee will allocate the railroad men sectors for housing construction just in the zone of intensive railroad traffic. And then just last week the plan, finally, was basically agreed on. Almost two years were spent on this struggle (not against the noise, but against the railroad department!). But still: is it just that the noise created by railroad transport should be paid for by the city suffering from this, at the expense of its own budget. I am convinced that this is not right.

[Question] Correspondent: The story you have told has reminded me of another complicated situation which has arisen here in the city. In the office of the chief state sanitary inspector of Kiev I saw a table under

the heading "Protection of the Environment." Discussed in it is protection of the air and water basins, protection of the soil and the struggle against noise in Kiev. Written to the left are points under the heading "Provided by the Plan for the Tenth Five-Year Plan," and to the right "Not Resolved in the Tenth Five-Year Plan." The points on the left are put in red brackets, and those on the right are in black. In the black bracket is the entry: "Removal of Zhulyany airport." This means, that in the next three years it will not be removed. But yet the old airport is one of the great centers of noise.

[Answer] V.A. Gusev: Yes, it is intended by the general plan for development of Kiev to remove the old airport beyond the city limits after 1980. But even today the total area of the noise action of the airport comes to 102 square kilometers, that is, 13 percent of the total area of Kiev in the limits of the city boundaries. The specialists are insisting on the fastest possible removal of the airport. We are still forced to resort to temporary measures: a decision of the city executive committee has been prepared about prohibiting housing construction in the region of Zhulyany. We cannot do more than this. This expensive measure is not within the competence of city authorities.

[Question] Correspondent: Well, there is nothing surprising in that you sometimes have to come up against problems which the city itself is not in a position to solve. They are related to the category, I would say, of super-problems. However in the fight against noise the city soviet has some great possibilities. In the sanitation service I was shown a list of electrical, carpentry, footwear and other workshops which were closed by agencies of the sanitary inspectorate as a result of complaints from residents. They also acquainted me with a representative list of officials--individual "fine payers" punished for regular exceeding of the norms of production noise. Encountered here are the names of chief engineers and chiefs of shops, directors of stores and other leaders of different ranks--from the deputy director of the Institute of Electrowelding imeni Ye.O. Paton of the Ukrainian SSR Academy of Sciences to the head of a dining hall under the playful name of "Dem'yanova ukha" [reference to Krylov fable]. How effective are such measures?

[Answer] V.A. Gusev: Do you see, here it would be possible to say that in the struggle against noise all measures are good. As we have already said, there is the resolution of the government of the republic. There is the corresponding decision of the city executive committee. The work on the struggle against noise in the Ukraine is controlled by the Republic Interdepartmental Commission, which is headed by the deputy chairman of the Ukrainian SSR Council of Ministers, V.Ye. Semichastnyy. By the way, in May of this year the commission heard a report on the practice of reviewing complaints about noise coming to the city executive committee.

When the offensive proceeds in a broad front, all kinds of forces participate in it. The attack on noise is being waged here also by various means

and in several directions at once. Built recently was the fine Moscow bridge over the Dnepr, which made it possible to take a substantial flow of transport out of the city. Sources of increased domestic noise have been registered (mainly according to the statements of workers). A passport system is being implemented for equipment which generates noise. A list has been compiled of enterprises which have a negative effect on the acoustic regime of the surrounding territory. A limit has been put on the bringing of products to stores at night (except for bread). A resolution is being worked out which will ban the use of private motor boats and launches on the urban section of the Dnepr. Do you know how many of them there are in Kiev? More than 20,000. On Saturdays and Sundays the noise on the river is such that the people on the beaches cannot hear one another. We will take the motor boats beyond the limits of the city, leaving only the rowboats and sailboats.

With respect to administrative measures of influencing the people who bear the responsibility for non-fulfillment of decisions about combatting noise, they, in my view, are still not effective enough. Well, the sanitary inspectorate fined the director of "Gastronom" 10 rubles... No one knows about this, and even the sum of the fine itself, let us say frankly, will not hurt the director's pocket badly. How much more effective would it be if the guilty parties were summoned to a meeting of the rayon executive committee's commission, and then still criticized severely in the local newspaper or on television, where in general it would follow to have a permanent "anti-noise" segment. Incidentally, LITERATURNAYA GAZETA, as far as I know, has long and actively come out with materials about noise, more correctly, against it.

[Question] Correspondent: It is interesting to find out, Vladimir Alekseyevich, your opinion about these statements in LITERATURNAYA GAZETA, particularly about the recent article by the poet Oleg Dmitriyev, "Noise in the Home."

[Answer] V.A. Gusev: It is good that a writer's newspaper treats this topic so energetically, attracting the attention of the community to it. In this sense Dmitriyev's article, in which it talks about how we ourselves violate the quiet in our own home, forcing the neighbors to suffer, seems useful to me. The discussion, ultimately, is about culture, about good breeding, about ethics, and then not for others, not in the collective, but by yourself in your flat, behind the closed door. The prescriptions proposed by the author of the article appear not completely realistic to me. To telephone the flat and demand silence in the name of the zhek [housing operation office] community: in my opinion this will only cause new noise... And then not everyone wants it, silence, as is clear even from readers' responses published in LITERATURNAYA GAZETA. And they do not always want it. So, let us say, Dmitriyev has taken as an epigraph for the article a line from a poem by Andrey Voznesenskiy: "I want silence, silence..." But then the very same poet has lines which speak about the opposite desire: "Return the music to me, without the music it is boring..." Well, so what--all are right: at that time quiet was desired, and now, music.

The house in which we live... We have written rules, by which it is categorically prohibited to disturb the peace of the citizens, under threat of administrative punishment. It is necessary clearly and strictly to control the fulfillment of these rules. Everything else in our building should be provided by equipment. Also necessary are partitions and ceilings which do not let any kinds of sounds pass through. Needed are stereo-headphones with the use of which your son or daughter can revel in the most fashionable "ultrasounds" at the tape-recorder and you during this time will be able to read the newspaper in peaceful surroundings. It wouldn't hurt to have earphones also for the television set, and for transistor radios.. We need portable radio stations (like militia workers have) which will allow railroad dispatchers to transmit their commands without disturbing the residents of streets near the stations at night. All this is possible. And it depends only on us. On all of us.

I want to add also that according to the forecasts of our specialists and scientists, the acoustical situation in Kiev, with fulfillment of all the measures outlined, will be significantly improved by 1980. But this also depends on all of us.

10908
CSO: 5000

CLEAN AIR PROGRAM STARTED IN NOVOSIBIRSK

Moscow IZVESTIYA in Russian 25 Aug 77 p 5

[Article by A. Boykov, chief of the regional State Gas Purification Inspectorate, Novosibirsk: "Service for Clean Air"]

[Text] In Novosibirskaya Oblast much has been and is being done for protecting the atmosphere against industrial pollution. This work was regenerated especially after the resolution of the CPSU Central Committee and the USSR Council of Ministers "On Intensifying Nature Conservation and Improvement of the Utilization of Natural Resources."

People's control groups and posts increased their activity. Thus, jointly with state supervision agencies the inspectors conducted a check of the protection of the atmosphere against pollution at these plants: the aircraft plant imeni V.P. Chkalov, the precision machine building plant, Siblitmash plant, the Trud plant, the fat combine and others. At the switch plant of the Ministry of Railways, where the gas level in the adjacent zone constantly exceeded sanitary norms, the intervention of the inspectors speeded up reconstruction of the enterprise. Ideal gas-trapping equipment will be installed there.

Jointly with the state motor vehicle inspectorate and the Novosibirsk Scientific Research Sanitation Institute the patrol members were engaged in checking passenger motor transport for the purpose of reducing the level of exhaust gases on city streets. People's control agencies of the oblast and its cities are giving support to the inspecting organizations waging the struggle for protection of the environment. One of such organizations is the gas purification inspectorate, the obligation of which is to reveal sources of pollution of the atmosphere, and to check on the fulfillment by enterprises of the laws, the orders of ministries and departments aimed at preserving the purity of the air.

As a result of the joint efforts of people's inspectors and the inspectorate, in the last four years in the oblast and in Novosibirsk itself, about 400

-gas and dust trapping installations were put into operation and rebuilt and at certain plants services for the operation of such devices were organized. Just last year in Novosibirsk 20 small boiler rooms were closed, put into operation were 55 new facilities for purifying the air of industrial discharges. More than 120 were rebuilt and put into working order. All this made it possible to reduce substantially the harmful discharges into the atmosphere.

The results are positive, but they cannot satisfy us. A significant part of all the sources of air pollution still is not outfitted with trapping installations, and one-third of those in operation is not being operated satisfactorily. The oblast and city people's control committees have indicated repeatedly to the managers of certain enterprises the necessity of taking more effective measures for protection of the atmosphere. But the trouble is that the ministries and departments are not always attentive to the requests about allocating the necessary means and resources for construction and renovation of such installations.

In the union ministries of nonferrous metallurgy, construction, and the building materials industry they take their time regarding this important matter. At the Novosibirsk Tin Combine an installation for wet purification of gases was to be built back in 1974, however its introduction was carried over to the current year. But, it seems, even this deadline is unrealistic since the USSR Ministry of Nonferrous Metallurgy has allocated up to the ened of the five-year plan a little more than a million rubles out of the 3.6 million needed, and by "tradition" Glavnovosibirskstroy [Main Administration for Construction in Novosibirsk] is not assimilating these funds either.

For many years in the RSFSR Ministry of the Building Materials Industry they have not been in a hurry regarding renovation of the Teplopribor [heating device] Plant in Iskitim. Matters are also unsatisfactory regarding air purification at enterprises of the USSR Ministry of Construction. A large amount of critical raw material literally goes down the "tubes." At the Novosibirsk Plant No. 1 for Reinforced Concrete Products bag-type filters went out of order and due to this henceforth a large amount of cement, gypsum and lime is flying up into the air.

Unrortunately, not all business leaders or engineering workers have understood that protection of the environment is a major state task. Its successful solution depends, however, not only on awareness and the desire to undertake the matter. Sometimes also purely technical, hard-to-overcome obstacles arise on the way. A serious lag behind the requirements has taken shape regarding development and output of devices to control the dust level. This matter was given to the USSR Ministry of Instrument Building, Means of Automation and Control Systems. In regional state inspectorates, such as ours, there are none of these devices, nor are there any at the industrial enterprises. But yet a full four years have passed since the Ministry of Instrument Building was instructed to design and develop them!

Also causing alarm is the fact that existing gas and dust collecting installations for a long time have not been registered in the state inspectorate. No one will decide to put out an automobile on the assembly line if it does not go through technical inspection, however the effectiveness of operation has not been checked for years on many operating purification installations. There is another disturbing circumstance. Not all enterprises are themselves in a position to check the effectiveness of the dust and gas collectors. But there is no strong, technically outfitted interdepartmental organization for checking and adjusting the units in Novosibirskaya Oblast. In our opinion, the need has arisen to create such an organization in each oblast.

Also not sidestepped is the question of flexibility in the work of the inspectorate. The zone of its control includes two oblasts, located on many hundreds of thousands of square kilometers. But the inspectorate has no transport.

The 25th party congress included protection of the environment among the most important tasks of the five-year plan. And therefore the results of the work of production collectives in this direction should now be considered when summing up the results of plan fulfillment and socialist competition.

10908
CSO: 5000

POLLUTION VS CARS OF THE FUTURE

Moscow IZVESTIYA in Russian 21 Oct 77 p 4

[Article by R. Akhmetov, TASS correspondent: "Car for the City of the Future"]

[Tex]] The problems involved in protecting the air basin from contamination by toxic discharges of transportation vehicles was the focus of attention at the All-Union Scientific Conference which took place in Khar'kov. It was organized by the USSR Academy of Sciences, the Ukrainian SSR Academy of Sciences together with the Institute of Problems of Mechanical Engineering of the Ukrainian SSR Academy of Sciences.

Scientists of Moscow, Yerevan and Kaliningrad are working to create an essentially new type of transportation--electric cars operating on storage batteries. With time it will significantly crowd out customary cars and will free the cities of exhaust and noise. Experimental runs of these machines have already begun. It is true that they cannot run further than 100 kilometers without recharging the battery. Therefore other models are being developed at the same time. In particular, a model of a hybrid electric car with combined power engineering has been manufactured: a small internal combustion engine operating in the most optimal fixed pattern and the storage batteries are recharged while running. This model is able to compete with the normal car in the distance of its run.

Tests of another representative of future transport are being made on the roads of the country--the gas turbine truck. It was designed by the Gor'kov automobile engineers in cooperation with the specialists of the Yaroslav Motor Plant. The advantages of the turbine include its service life measurable in hundreds of thousands of kilometers of operation and the operating expenditures which are insignificant as compared to the internal combustion engines. The most important is that it permitted a reduction in the toxicity a dozen times.

Specialists are also interested in the technical developments which have appeared at the dawn of the automobile age. In particular, the internal

combustion engine which was invented in the last century by the Englishman R. Stirling, may become the "heart" of the automobile of the near future. From an ecological viewpoint it is irreproachable--hygienic, noiseless, can run on any fuel, including nuclear. However the "Stirling motor" did not become widespread due to its bulk, small power and complex tuning. The leading car companies of the United States are occupied with its perfection. Work in this direction is being conducted in the Moscow Higher Technical School imeni Bauman and the Moscow Highway Institute. Many complex technical problems remain to be solved in order to obtain a compact, powerful and easily controlled motor.

At the same time the searches continue for a replacement of gasoline with a less toxic fuel. In the Institute of Physical Chemistry of the USSR Academy of Sciences and the Institute of Problems of Mechanical Engineering of the Ukrainian Academy of Sciences basic research is being conducted on the use of hydrogen and a mixture of it with gasoline as car fuel. Hydrogen is a sterile fuel as compared to gasoline: water is the product of its combustion.

Another effective method for reducing the toxicity of exhaust is the conversion of motor vehicles to liquified natural gas (propane-butane). The exhaust from these cars contains 3-4 times less carbon monoxide. The "Basic Directions for the Development of the USSR National Economy for 1976-1980" sets the task of expanding the production of gas cylinder vehicles to be supplied first to the large cities. The use of gas cylinder trucks was begun in Moscow several years ago. Now over 3,000 of these vehicles are operating in the capital. Natural gas has also begun to be used as a fuel in the fleets of Omsk and Kuzbass [Kuznetsk coal basin]. Tests are being made on light taxis and buses which operate on natural gas. Their serial production will be set up at the automobile plants in Gor'kiy, L'vov and Likino.

Research and design work to reduce the toxicity of exhausts is also being conducted in other directions. The future will show what paths are the most promising.

9035
CSO: 5000

BRIEFS

TALLIN ECOLOGY CONFERENCE--It is written in the draft of the new USSR Constitution that measures are being taken in our country for the protection and scientifically grounded utilization of the earth and its depths, the plant and animal world, for protection and improvement of the environment surrounding man. Devoted to different aspects of solution of these problems was a scientific conference of the Baltic republics which ended on 28 September in Tallin. Heard in the course of two days were about 50 papers by scientists from Moscow, Latvia, Lithuania and Estonia. "Theoretical Research in the field of the stability of ecosystems and practical recommendations make it possible to substantiate scientifically the national economic measures and objectively to evaluate their influence on the environment," the ETA correspondent was told by Doctor of Geographical Sciences M. Glazovskaya (Moscow State University). "The conference is the first attempt to systematize the data in this field and to reflect the present status of applied ecology in the Baltic region." The conference was organized by the Tallin Botanical Garden of the Estonian SSR Academy of Sciences, where these problems have been studied for many years now. [Text] [Tallin SOVETSKAYA ESTONIYA in Russian 29 Sep 77 p 3] 10908

ELECTRICAL FILTER--Khar'kov, 2 August. For the first time in world practice Khar'kov scientists have proposed and implemented a new method of purifying vapors of liquids used in ferrous metallurgy for cleaning scaling off of rolled metal, vapors which are ejected into the atmosphere. For this, special electrical traps which catch metallic dust are installed in the path of the gas-vapor flow with a temperature of up to 500 degrees. Such a unique cleaner reliably safeguards the air against contamination by the wastes of production. [Text] [Kiev RABOCHAYA GAZETA in Russian 3 Aug 77 p 2] 10908

SOVIET-BRITISH ENVIRONMENT COMMITTEE--Held in Moscow from 4-6 October was the fourth annual session of the combined Soviet-English committee for cooperation in the field of protection of the environment. Reviewed at the session were reports about fulfillment in the Soviet Union and in Great Britain of joint research programs in this important field. The session's participants also discussed questions of deepening and expanding the cooperation of the two countries in the framework of coordinated projects, including in the sphere of preventing pollution of the atmosphere and of water bodies, and rational utilization of land and water resources. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 42, Oct 77 p 20] 10908

FLUE GAS SCRUBBERS--Designing and building a unit for protecting the air basin from pollution at the Sinarskiy Pipe Plant earned 1977 USSR Council of Ministers prizes. Much credit was due to the VNITIchermetenergoochistka Institute and the Uralalyuminstroy and Vostokmetallurgmontazh trusts. The capacity of the purification unit is 685,000 cubic meters of gas an hour. Up to 92 percent of nitrogen and 95-98 percent of vapor and aerosol of sulfuric, hydrochloric and hydrofluoric acids, given off at the enterprise's etching baths. Installation of the towering scrubber droplet-traps was managed with a helicopter crane. The bladed helper enabled installers to cut down on labor outlays by 43 percent, reduce operational costs by 16 percent and shorten schedules by three months. The quality of construction of the installation is excellent. The actual cost was 42,000 rubles under the estimated figure. Construction of similar complexes is going on at several other metallurgical enterprises. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 37, Sep 77 p 8] 10123

CLEAN DNIESTER--Recently the CPSU Central Committee and the USSR Council of Ministers made the decision to take measures to intensify protection of the Black and Azov seas from contamination. The Bukovina sugar refiners were one of the first to respond to this decision. In cooperation with scientists they implemented the latest system of biological purification of industrial effluence. It was decided to use the system of oxidizing units to purify the sugar refinery effluence. The essence of the system is that microorganisms are grown in the units which under the specific conditions of the sugar plant destroy the harmful organic admixtures in the industrial effluence. The new purification facility is also hooked up to the sewer system of the sugar refinery settlement, Kostrizhovka. This purification facility is not the first at the enterprise. Here there is successful operation of a previously produced powerful water purification system used for washing and transporting sugar beets. The purified water is returned to the production cycle for reuse. As a result of this the consumption of Dniester water was successfully reduced by 40 percent. When the last phase of the system is put into operation its overall power will be about 8,000 cubic meters of water per day. [Text] [Kiev PRAVDA UKRAINY in Russian 30 Jul 77 p 4] 9035

SMOKELESS BRIQUETS--A new method for briquetting lignite fires has successfully passed plant tests. It was developed by the employees of the Frunze Polytechnical Institute together with Moscow scientists. Instead of adding to the coal residue substances which release a lot of smoke during combustion, resinous components are used. The briquets do not get wet in water and burn without smoke. The fuel caloricity was increased 1.5 times. Now residue can be used in mining which was previously dumped. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 40, Oct 77 p 80 9035

AIR SEPARATION UNITS--A series-produced lot of new air separation units was sent to the chemical enterprises of the Volga and Moscow areas by the collective of the Odessa Kislorodmash Association. These units are not only more reliable, but lighter--each installation weighs several tons less than earlier models. Enterprise engineers applied a new air purification principle in the installations; this permitted replacing cumbersome purification units. Each sixth installation series-produced in the association is manufactured of economized metal. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 37, Sep 77 p 8] 10123

CSO: 5000

GOVERNMENT PLAN TO SET ENVIRONMENTAL POLLUTION CRITERIA

Athens ELEVTHEROTYPIA in Greek 1 Sep 77 p 2

[Text] The government is promising a pioneering step in land-use planning, with the drawing up of a preliminary plan on the protection of the environment, and more particularly on the criteria for the development of our national maritime areas.

Ar. Kalandzakos, deputy minister of coordination, has decreed that a committee of representatives of 11 inter-connected agencies be formed for the elaboration of this preliminary plan.

According to the government's plans, for the first time "uses of the sea" will be studied, on the basis of the model of "land uses."

This preliminary plan will aim at gathering ecological and economic data which will give a clear picture about the present-day situation in the Greek seas and will permit measures to be taken with respect to the corresponding problems. Notable among these measures are the following:

The preliminary plan of the Ministry of Merchant Marine, which has already been introduced into the Chamber of Deputies, and which establishes the institutional framework for the protection of the maritime environment of our country and provides for the imposition of very severe penalties for violations.

The study on the establishment of a center for combating oil spills, which possibly can be used as an international center for emergency operations.

The study on the protection from urban wastes of the enclosed seas of the Saronikos, Thermaikos, and Pagasitikos Gulfs, which will cost 40.5 million drachmas for the Saronikos Gulf, and 36 million dollars [sic] for the other gulfs.

The imposition of waste purification systems for industries which are being established, and the gradual implementation of this measure with regard to existing industries.

The work which is now under way on the creation of protected sea areas (maritime parks).

On the basis of the international agreement of Barcelona which has been signed and the relevant protocols, the participation of Greece in a number of programs for the protection of the Mediterranean Sea from pollution.

It is stated in a relevant announcement that the systematic treatment of those problems which are connected with the maritime region has been a special concern of the Greek government, in view of the vital importance of the maritime ecosystems on the improvement of the quality of life.

In Elevsis

Special teams from the Ministry of Industry and Energy are continuing their investigations to locate the sources of pollution of the environment at Elevsis.

Meanwhile, Minister of Industry and Energy Konofagos, in a meeting he had with industrialists last week, asked for the cooperation of the SEV [Association of Greek Industrialists] in finding the most rapid and effective way to treat the problem of the pollution of the environment.

Mr Konofagos consulted yesterday morning with representatives of the cement industries on the same matter. As the minister said, in these industries the problem of pollution is being dealt with, through the placement of filters in the smokestacks of the plants, the installing of which should be completed within 6 months.

As is known, in the Elevsis area there are essentially seven industries which are polluting the atmosphere, the facilities of which are now being visited by appropriate organs of the ministry, which are checking on the measures being taken for environmental pollution protection.

12114
CSO: 5000

ATHENS AREA POLLUTION PROBLEM DISCUSSED; CAUSES, PROGRAMS CITED

Athens TA NEA in Greek 10 Oct 77 p 7

/Article by Sp. Mondanos: "We Shall Pay Ransom in Order to Breathe!"/

> /Text/ For 30 years now we have been asked to pay the price of an uncontrolled profiteering, the result of which was to have concentrated in Athens 60 percent of industry and the 3 million people who serve it. If we do not as a whole accept this "per capita tax," then long before the century is over the capital will drown in the filth it itself creates continually and the erstwhile bright sun of Attiki will throw its light on an unrecognized Saronikos Bay, on a dead sea.

Who will in the end pay the penalty for avoiding the complete destruction of the home environment from the industrial and other pollution threatening Athens?

A proclamation by the Organization of Economic Cooperation and Development says: "The polluter is paying the price." But the bill that the famous Land Zoning Plan and Program presented to us last year was exhorbitantly high: Athens will have to absorb from the public investments budget 580 billion drachmas in 1970 prices until the year 2000 in order to cleanse itself and to proceed with meaningful infrastructure towards the future. Proportional naturally should be the contribution of the economy's private sector which will hasten, of course, to load the consumer with the cost just as the state will charge it to the taxpayer. Therefore, the dilemma we are facing as of now is one of the most difficult:

One whole generation of Athenians or, better still, all the Greeks are asked as of now to pay the heavy price of an unchecked profiteering, the result of which was to have concentrated in Athens 60 percent of industry and the 3 million people who serve it, regardless of their professions, within the broad area of the capital.

A Dead Sea

If we do not accept as a whole this per capita tax--the result of an unplanned and thoughtless development for which the country's plain citizen bears no responsibility--then long before the century is over the capital will drown in the filth which it creates itself continually and the erstwhile bright Attiki sun will at sundown throw its light behind the thick clouds of soot and sulphur dioxide on an unrecognizable Saronikos Bay, on a dead sea which will emit only stinking gas bubbles--the result of the decomposition of its depths.

Saronikos--tomorrow's cesspool of the Greek state--is indeed being rapidly transformed into a source of terrible pollution as it receives daily 500,000 tons of refuse and industrial wastes from all sorts of refineries, steel plants, tanneries, food plants, paint factories and thousands of handicraft industries which uncontrollably discharge their wastes into the bay--wastes which these industries do not have the economic capacity to treat and purify.

If we accept the cost needed to avert the catastrophe, we should nevertheless figure out precisely if the whole infrastructure of the Greek state's services allows for such an expectation which concerns the survival of Athens:

a. Measurements made in 1972 proved that an area of 1.3 square miles of the bay's bottom had been covered already by non-acetic mud--6 meters deep--a filthy slime where only one family of protozoa was able to live.

b. In 1974, 8 square kilometers of the bottom of Saronikos was covered with such filthy slime--it had become a dead area.

c. In 1976-77--no measurements have been made--this dead area of non-acetic mud, so named since it does not contain any oxygen, will be doubled or tripled. What will happen, indeed, by the end of the century?

What Happened to the Agreement?

Since forecasts for such a long period of time would be risky, it is better to examine what the Greek state has done since 1972 when the UN World Health Organization signed with the then government an agreement to study the pollution in the greater Athens area--a model city from the point of view of the unorthodox development which characterizes many of the capitals of underdeveloped countries. This agreement created the Athens Area Pollution Control Service to conduct studies in cooperation with other agencies such as Dimokritos /Atomic Energy Commission/, Institute of Oceanographic Studies, and the Public Works Ministry.

The studies are still going on, but nothing more. After the change in government /1974/ some legislation has of course been introduced. Now we have articles 24 and 117 of the constitution and law 360 of 1976 about the

protection of the environment. One of the organizations for the protection of the environment told us about what has been done since then: By decision of the ministers of finance, coordination and industry the decision to establish a shipyard at Lykhnari of Korinthia /Nome/ has been voided in order to protect Saronikos Bay. But this sound decision raises the question: Under what logic and reasoning did these same ministers approve the expansion of many other industries along the Saronikos shores since three of these industries alone discharge into the bay pollutant matter at least 10,000 times greater than that discharged by the Saronikos shipyards?

Six years ago the Public Works Ministry asked for bids on an international scale for a study for the treatment and proper disposal of the wastes in the whole Athens metropolitan area. The relevant agreement was signed just about 5 months ago.

Studies for Nothing

For 40 million drachmas the foreign firm, Watson, undertook the obligation to prepare in three stages a general study for disposing of the capital's wastes, a project expediency study, and preliminary studies for each particular project. But it will take at least 5 years before these studies are ready. Then the competitive bids will be asked, to be followed by the construction work. We have time until the end of the century. But what shall be done until then?...

Until then the work of the Capital Drainage Organization /OAP/ will continue its work at a snail's pace with a budget of 16 billion drachmas. The work has thus far covered by only 30 percent the needs for the capital's drainage. And it will take at least 20 years to complete the 3,500 kilometer-long pipeline. Is this due to lack of appropriations or to lack of organizational and technical possibilities? In any case the Ministry of Public Works is getting prepared to "wring" from the populace the needed money under the method of the "reciprocal fees."

The Athenian society which as it seems has become sufficiently fattened during the period--the short period--it called itself a consumer society, is now asked to pay dearly until the end of the century for the drainage of its wastes, with an equitability which will hurt mostly the poor people--exactly those who have not become fattened during the years of prosperity.

Polluter is Paying

"The polluter is paying," claims OECD. It appears, however, that despite all these things, that beyond the social deontologies, the economic indispensabilities are always more effective. Even as a "profit making city," Athens will be unable to function as a result of the undergrating it undergoes due to the destruction of its natural environment.

The West European countries have become aware of this fact and have long since taken measures. In 1975 the cost of protecting the environment from industrial pollution had reached 1,376 million dollars in Germany, 60 million dollars in Denmark and 124 million dollars in Sweden. This difference in the cost of protecting the environment creates inequal competitive conditions among the EEC countries, a fact which dictates the need for common standards for the protection of the environment. A recent proposal by the European Council is already pending before the EEC Council of Ministers.

Thus, the Greek industry also is expected to face substantial costs for environmental protection soon after the country's accession to EEC--costs which will not be able to be born if its investments in anti-pollution installations are left as a last minute task. Two recent decisions by the Hellenic Industrial Development Bank /ETVA/ aim at helping Greek industry to cope with this big problem it faces: a) All loan receiving industrial and tourist units will henceforth be obliged to present permits for the operation of installations for the treatment of their wastes while ETVA will have the right to inspect these installations which must be ready to operate before the last installment of the loan is granted and b) all enterprises interested in having waste treatment installations will be granted loans by ETVA whose administration, moreover, is planning to recommend to the Currency Committee favorable loan granting conditions.

Is It Already Late?

Under the special recession conditions which create the phenomenon of investment abstention, these ETVA decisions--the result of recommendations by its president, K. Konditis--could perhaps curtail somewhat the rate of pollution and undergrating of the Athens area which otherwise cannot operate, not even as a productive center of the country. On the other hand, in a certain sense, this loan granting is in substance a developmental project especially from the viewpoint that it aims at ensuring the future competitive ability of Greek industry which, as we have already pointed out, will in the end be paid by the Greek consumer.

Fate of Athens

With regard to Athens as a cultural and living center for 3 million people it is perhaps late. Even with reduced rates of pollution, its city planning and traffic deadlocks are such that it is difficult to save it at such a cost which would be at the expense of the whole country. The hydra-like headed capital should perhaps give the priority to the rest of the country whose equitable and proportionate development will decide the future of Athens also. This country will then be able to create cultural projects also instead of the profit-making cities as it has been able to do until now with such unequal contribution by its citizens.

7520
CSO:5000

PIRAEUS ENVIRONMENTAL PROTECTION OFFICE PROPOSED

Athens TA NEA in Greek 3 Oct 77 p 6

/Text/ The results of the Seminar on the Environment held in Piraeus this week at the initiative of the Piraeus municipality as well as the highlights of the speeches delivered by various scientists on the question of the sea pollution will be announced today.

Even though it is risky to express advance opinions, nonetheless, it is not difficult to point out that during the seminar sessions contradictory views were expressed--if one exempts the purely scientific analyses of certain phenomena. The greatest contradictions are found in the following /excerpts/:

a. "In Greece, the pollution of the sea is very limited in area and the health legislations are extremely strict. For this reason the danger from sea-bathing is minimal or nonexistent according to today's facts..." (from the lecture of /University of Athens/ Health School Professor I. A. Papadakis).

b. "For Piraeus the pollution of the sea is of primary importance because its two small enclosed ports of Zea and Mikrolimanon are very highly polluted with blue seaweeds and colonic bacteria so that the amount of BOD /expansion unknown/ is increased. The main port too is polluted. The 14 city sewers for home and rain water on the one hand and the pipelines of the fertilizer factory on the other, create an unhealthy condition which causes death to the microcosm of the main port of the country..." (from the speech by geologist P. Khristodoulakis)

The scientific analysis of the phenomenon and of the various forms of pollution was followed by proposals which finally may be accepted. Among these proposals were: to create an Environmental Protection Office in Piraeus; to establish a coordinating committee in all Greater Piraeus municipalities; and to appeal to international environmental protection organizations as a result of the inaction on the part of the authorities.

7520
CSO: 5000

POLLUTION CAUSING LARGE NUMBER OF FISH DEATHS IN ELEVSIS AREA

Athens TA NEA in Greek 24 Oct 77 p 5

/Article by Aris Skiadopoulos: "We Too Shall Perish Like the Fish"/

/Text/ He looked thoughtfully at his fishing boat "Mairoula" which was moored along with 50 other boats in the small Elevsis harbor, then he glanced at the reporter and again back at his boat. The sky was deep blue and the sea very black. Finally, Kyr /Mr./ Vasilis started talking, quietly at first, then louder until his voice reached a screaming pitch.

"I tied it up for good. All of us here in Elevsis could go to hell and no one would care. These boats here and the nets represent money earned with our sweat but we cannot use them any more. The fish we catch die in the net because of the pollution. We have become desperate and we have tied up our boats. We too are now waiting for our turn. The fate of the Elevsis fish await its inhabitants also..."

The indignation in Elevsis was already reaching its peak. Six hundred kilograms (fat eels and fries) were dead and floating on the surface. It was about time for the authorities to be concerned. Representatives of the Social Services Ministry had gone there early Saturday morning /22 Oct/ to take water samples from various areas of the bay. At noon the fishery director of the Ministry of Agriculture paid a fact finding visit to the harbormaster's office. The results of the /water/ analysis will be the first evidence of the preliminary investigation and, as a senior officer said:

"We shall give them the file and from there on the case will be referred to higher authorities who will decide whether to let continue the immunity of the industries and, at the same time, the threat to human and animal lives or to impose some measures and to start exercising sound control."

Outburst of Anger

In Elevsis last Saturday all boats were tied up. The nets were black from the oil in the sea. The fishermen were gathered in a shanty near

the small harbor. They were discussing the memorandum they planned to send to the president of the Republic, to the premier and the minister of agriculture. Their president is Giorgos Raisis. He is yelling and cursing--he cannot stand this situation any longer. Six hundred kilos of fish were caught dead in the nets and this is of great importance to the Elevsis fishermen who have to feed 100 families. He is talking plainly and spontaneously (and he does not care "if I say more than I should because we have been suffering for many years now").

"Oh, yes... You are a reporter... It is nice that you report what we say. On this side, my fellow countryman, we have the industries and on the other side the moored, inactive boats which have gas engines, and in this corner here we have tied up our boats because where else can we go fishing? The state imposes penalties on those who pollute the sea. Last year it collected 7 million /drachmas/ from a ship. Well, let the state give us 3 million to feed our families, now that it has placed the sea at the disposal of the shipowners and the industrialists... This place here in the old days was a meadow. The fish were abundant...a treasure. We lost everything because of the industries. Now, we too shall slowly fade away. Last Thursday, dead fish were washed ashore near the Votrys industrial plant and 2 days ago near the Khalyvourgiki /steel plant/. Two tons of eels distended with ammonia..."

He was followed by Kyr Thanasis Laskos, a cousin of the captain of the legendary /ship/ "Katsonis." He is an 80-year-old weatherbeaten fisherman. He has spent 65 of his years on the sea...

"After the fish we too shall perish. We were born right here and now the outsiders come to deprive us of our food. Our life is entwined with this bay, we have roots here. What can I say, young man? Do you see these small boats? You become infuriated when the dawn arrives and you see them tied up."

/Next to speak was/ Dimitris Papanikolaou, another fisherman: "These boats and the nets represent a fortune--a total investment of 15 million /drachmas/..."

"Why don't you go fish somewhere else?"

"Where? They do not allow us to fish 500 meters from the shore, 500 meters from the industries and 500 meters from the moored, inactive ships. Well, that's the whole bay, and that's all."

"And how do you make a living now?"

"Some are forced to work in industrial plants and others receive a negligible pension of 800 drachmas from the Farm Insurance Organization /OGA/. How can we make out?"

Kyr Dimitris Vasileiou points to the nets. "Do you see the yellow ones? We bought them a few days ago. The black ones you see further down were also yellow before we had cast them into the sea. Within 5 hours the pollution turned them black."

Fish Are Dying

Kyr Vangelis O Monokholias now and then goes fishing outside the bay with his wife since they have no other source of income...

"I go there slowly and we cast the nets in the open sea. But before you can bring the fish ashore they die. Well, it does not matter. Let the industrialists do what they please and let death come to us."

Thanasis Laskos: "They left their ships abandoned and dirty in our bay and they went to London..."

Monokholias: "I raised my nets 2 days ago and found them full of mazut and /you/ report that we are hungry, that this is the only pair of pants I have."

Everything Is Very Black

Dimitris Vasileiou: "This grass at the bottom of the sea was once very green. The crabs were gathering here and had a grand time! Now the grass is all black and if a crab happens to come here it dies."

Thanasis Laskos: "I had two caiques and three children. We used to go fishing together and we brought back a good yield of fish for the people to eat and for us also and we were happy. When the industries came the children left because there was no fish. Now I am alone and live on the negligible pension OGA gives me. Today I have food, tomorrow I am left with an empty stomach."

A Threat For All

If today's Minister of Industry Konofagos ("his ancestor was Doctor Konofagos who was killed during the Messolongi siege" according to Who's Who)were a candidate for election in Elevsis, it is almost certain that he would emerge as black as the nets from the sea. Because as Elevsis Mayor Levendis said:

"We are waiting in fear for the day when pollution will put us flat on our backs. All the people here in Elevsis have become aware of this pollution, no matter whether they are rightists, leftists or centrists. We all know that rightist, centrist and leftist lungs breathe daily the same foul air."

Last week (just before the dead fish were washed ashore) the Elevsis mayor and municipal council went together with the mayor of Mandra to /Minister/

Konofagos and handed him a memorandum with 8,000 signatures of people who live continually in the heavily polluted area.

"We will do everything, we will take care of everything. I have difficulties only with the Khalyvourgiki Company," the minister said, according to Levendis.

Promises Only

For 3 years now only promises were given to the people of Elevsis. Leventis tries to explain: "Conferences, deliberations, official reports, memoranda, complaints, mobilizations never had an effect on the government. No effective measure has been taken to protect the people. On the contrary, the "Khalyps" and Khalyvourgiki Companies were given permission to expand their facilities."

But that is not all. The Elevsis archeological area is dominated magnificently by a pool for the wastes of a known industry. No one knows when and who gave the permit for the establishment of this pool which desecrates our cultural heritage. The marbles have decayed. The fish are dying. And the people of Elevsis live there patiently and waiting...

Conclusions

In the middle of the week the Oceanographic Institute will announce its conclusions following the tests it made with the Elevsis sea water samples and the fish washed ashore. According to exclusive information the first results will mention the following:

According to recent first estimates, at least a year will be needed to finally clean up the Elevsis Bay provided that during this period the industries either remain idle or find a way to avoid discharging their wastes into the sea. The analyses made until now indicate that the Elevsis waters are the filthiest because, besides the pollution, they remain stagnant.

The first water samples contained hydrogen sulphide and many organic substances which neutralize the oxygen. An examination of the dead fish showed that they did not suffer from any disease and that, therefore, death was caused by lack of oxygen. The temperature in the Elevsis Bay is sufficiently high. The institute continues its research in order to find our the time needed to clean up the bay. For this reason samples of water are being analyzed at fixed periods of time.

Samples at the General Chemistry Laboratory

The State General Chemistry Laboratory has taken sea water samples from the area of the Khalyvourgiki and Votrys Companies where the dead fish were

found for the purpose of finding out the degree of toxicity in the two areas where these industries discharge their wastes. The laboratory has also taken samples from the wastes discharged by the two industries in order to establish if they contain poisonous substances. The cause for the death of the fish will be researched officially by the Toxological Laboratory which will announce its results in about 10 days.

The conclusions of the Oceanographic Institutes and those of the State General Chemical Laboratory will provide the first evidence for the preliminary investigation the Ministry of Merchant Marine has undertaken.

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CSO: 5000

FROGMEN TO INVESTIGATE ELEVSIS BAY AREA BOTTOM

Athens TA NEA in Greek 24 Oct 77 p 5

/Article by Giorgos Komis/

/Text/ The Port Police Directorate of the Merchant Marine Ministry ordered the Elevsis portmaster's office to undertake a preliminary investigation to ascertain the cause of the death of the fish as well as the source--the factory--which polluted the Elevsis area with poisonous chemical wastes.

At the same time, the appropriate technical authorities of the Aigaleo Nomarchy which has jurisdiction over the Elevsis area have been ordered to investigate the pools where the various factories at Aspropyrgos and Elevsis discharge their wastes. It is hoped that this investigation will reveal the degree of efficiency with which the installations for the treatment of the wastes at these factories operate. According to one version, the wastes which killed the fish must have been discharged into the sea without first being processed due to a damaged filtering device.

Also, special teams of Port Corps frogmen have been ordered to investigate the sea bottom of the area because it is suspected that there are more dead fish which have not yet been washed ashore. The death of the fish in the Elevsis Bay twice in one week leads to the conclusion that it was the result of the same cause which appeared a week ago. The quantities of the dead fish are washed ashore in batches. The most disturbing phenomenon is that among the dead fish are eels also, a fact which leads to the firm conclusion that the poisoning in this sea area is grave and that whole layers of wastes have settled at the bottom in a coastal area of about 2 kilometers long. Samples of dead fish have been sent to the State General Chemical Laboratory and to the Institute of Hydrographic and Oceanographic Studies for determining the specific chemical that caused their death.

The authorities are not willing to discuss the matter at all but reports state that the Votrys and Khalyvourgiki factories are the ones responsible for the deaths of the fish. It is further stated that as early as last week the Votrys plant had discharged wastes in the area. Another version

mentioned is that perhaps the wastes were discharged before their regular treatment. It is specifically mentioned that the chemical substances discharged into the sea may have escaped into the bay as a result of broken pipes. In any case, the authorities deny categorically that the pollution is due to oil or other substances from the inactive ships moored in the area or other passing boats. First, because no such pollution was observed recently and second, because such a disaster cannot be caused by oil or mineral products.

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CSO: 5000

REPORTS EXTENSIVE ANNUAL FIRE DAMAGE TO VALUABLE LANDS

Athens ELEVTHEROTYPIA in Greek 16 Sep 77 p 3

[Article by Lenas Pagonis]

[Text] The erosion of the soil which is occurring in Greece each year because of a deficiency of forests is equivalent to the sinking of an Aegean island--of average size--into the ocean. The explanation: A forest has as much capacity for holding rainwater and soil as a lake with the same area. However:

Some 40 percent of our country is cleared land which was once forests.

From 1830 to the present, 20 million stremmas of forests have been destroyed.

There is one forest ranger for each 34,000 stremmas of forest.

Of the total area of our country, 19.5 percent (25 million stremmas) is covered today by forests. And included in this percentage are all the bushy areas of the country as well as our pasturelands.

Each year in Greece, 60,000 to 70,000 stremmas of land in the mountainous region and a like amount in the plains sector are ruined by erosion of the soil, which carries away with it cultivatable ground, bridges, and so forth, since there are no longer any trees to offer resistance--something which is creating losses of 2.3 billion drachmas per year.

The state is paying out another 6 billion drachmas per year to import lumber for industrial uses.

As against the above costs, which are due to the lack of forests, the amount which the state spends for reforestation each year is about 100 million drachmas.

But in what ways are the forests being damaged? Only by fires?

Not Only Fires

From clearings for the purpose of acquisition of agricultural lands: Between 1953-1955, 150,000 stremmas of the largest forest in our country were cleared, at the mouth of the Nestos and of the Kotza-Orman streams, and this was given to the farmers by the government of that time. Today, only 5,000 stremmas of this forest have been reforested.

From appropriations. Between 1945 and today, the following have been appropriated: In the Peloponnisos and Western Sterea, 120,000 stremmas.

In Attiki, 45,000 stremmas.
In Thessalia, 50,000 stremmas.
In central and western Makedonia, 18,000 stremmas.
In eastern Makedonia and Thraki, 10,000 stremmas.
In Ipeiros, 2,000 stremmas.

From the establishment of residential settlements.

From the felling of trees by thieves.

From overgrazing.

From fires.

Spyros Dafis, professor of forestry at the University of Salonica and general secretary of the Geotechnical Chamber of Greece, spoke to us about the "disheartening situation of the forests" in our country. He said to us:

"The aims of reforestation are many. The production of wood (economic aim), the protection of the soil from erosion, the controlling of the flow of mountain water (water-control aim), the maintaining of an ecological balance. We are suffering from a lack of timber, while on the other hand we are being hurt by torrential freshets, of which there are some 700 which are "active." It has been predicted that between 1962 and 1985 the consumption of wood in industry will rise by 250 percent. Since the consumption of industrial wood is increasing, would not reforestation be advisable for the production of wood for industrial use in our country? Each year, the state spends 6 billion drachmas to import wood from abroad. But in addition to wood, the contribution the forest makes in the direction of erosion resistance, water control, a healthy environment, and a regulating of the ecology of the environment--things which cannot be imported--is yet another important reason for reforestations.

Cleared Land 40 Percent

"Some 40 percent of the entire area of our country today is made up of abandoned fields, farms, pasturelands, and former wooded areas which have been destroyed--that is, 50 million stremmas! The selection of sites for reforestation, in order to be done properly, requires ecological investigations (which are insufficient in Greece) and a more general land-use study which should be made prior to the reforestation."

K. Niavis, professor of plant physiology and president of the Greek Society for the Protection of Nature, considers reforestation to be a matter which requires the charting of a national policy, and in connection with reforestation, which is taking place at the rate of (only) 50,000 stremmas per year, he proposes:

That the extent of reforestation done per year should be quadrupled, and that the appropriations and equipment which are needed for this should be increased.

That the contribution made by volunteers (schools, boy scouts, and so forth) should be promoted to the utmost.

That natural reforestations should be protected from vandalism of every sort.

That the issue of nomadic stockbreeding should be definitively resolved.

Stockbreeding Versus Forests

That the services should stop fighting among themselves (the forest services with the other services) about which--stockbreeding or the forests--will have priority. There should be a coordinating of the services, and provisions should be made for the terms, conditions, and areas of pasturage for flocks and herds.

That the manpower which works for the protection of the forests and the equipment which is used (mobile units, telecommunications, and so forth) should be increased, and that there should be a system for the prompt locating of fires as well as for curbing them.

That penalties for violations should be made severe, and that policing for the protection of the forests should be increased.

"If a herdsman leases a meadow for pasturing his herd, he will spend about 50,000 drachmas. But if he lets his flock go free in a forest, the worst that can happen is that he will be tried and sentenced to pay at most 30,000 drachmas. Therefore, why should he not take the chance?" an official of the Directorate of Forests said to us in connection with the unchecked uses of the forests for pasturelands.

In connection with the protection of the forests, their preservation, and their recovery, the work force which now exists--according to data of the Panhellenic Union of Foresters--is as follows: For the 20 million stremmas of forests which exist in Greece (65 percent public, 35 percent private) there are employed 650 forest rangers (1 forest ranger for each 34,000 stremmas, approximately), 495 appointed foresters and 400 non-appointed foresters, and 720 forest guards.

This is a force which is absolutely inadequate for our forests (those forests which are left, seeing that the recent fires alone have destroyed 300,000 stremmas), in conjunction with the shortages of standing equipment, tools, vehicles, and auxiliary personnel for the protection of the forests, at least from fires.

All the experts who spoke to us emphasized the need for an increase in state appropriations for reforestation if the state wants forests to exist in our country. Because if it has forests, it has water, springs, and streams, it has timber, it has an investment of energy, it has animals, it has the preservation of the ecological balance, and it has thus possibilities for survival.

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REFUSE SEEN ENDANGERING WATERS OF LAKE MARATHON

Athens ELEVTHEROTYPIA in Greek 27 Sep 77 p 1

[Text] "There is a danger that the water of Lake Marathon might become polluted by the throwing away of sacks of garbage in the area and from the creation of industrial facilities at the sites of discharge of water into the lake."

This is stated in the findings of a preliminary investigation which was conducted by the Capital Suburbs Security Police, following a report by the archeologist, Professor Kon. Fotiou, which had been submitted some months ago to the Athens public prosecutor.

Mr Fotiou maintained in his report that many rivulets and streams in areas near the lake have become garbage dumps, and that when it rains, many unsanitary substances from this garbage as well as from industrial units pour into the lake and pollute the water, which is drunk by the residents of Athens.

This finding states that the water of the lake is not polluted, that the controls dictated by science and the public health regulations are being followed.

But a danger is emerging from the dirtying of the lake's surroundings, which increases with the throwing out of refuse by residents of the surrounding areas and with the creation of installations of industrial units at the sites of discharge of water into the lake.

For this reason, the residents should not be dumping out garbage, and the surrounding communities should concern themselves with the creation of garbage dumps, so that the streams can remain clean.

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STUDIES TO BEGIN ON RECYCLING OF WASTE AND REFUSE

Athens ELEVTHEROTYPIA in Greek 9 Sep 77 p 9

[Text] In the midst of the decade of the 1960's, one of the axioms which were prevalent at the London School of Economics was "tell me what a people does with its garbage, and I will tell you the degree of its development."

This slogan, somewhat delayed, has reached our country, and in particular Salonica. Thus, Minister of Northern Greece N. Martis has agreed to a proposal for the drafting by the technical chamber of guidelines for studying the planned residential improvement of the areas around Kalokhorion, which are known as the "garbage dumps" of Salonica. This study will include the entire area from the state highway to the sea and from Dendropotamos to the Gallikos River.

According to an initial proposal by Professor I. Triandafyllidis, it would be possible to establish in this area a commercial center, the Salonica International Fair, a large athletic center, and a number of university schools, as well as model settlements for the housing of the residents of present-day Dendropotamos and of others now living in shanties.

And what about the garbage? Thought is being given to the establishment of a "pulpifying" plant for this garbage, for its conversion into fertilizers.

The preliminary studies have already begun at the technical chamber. If the plans do not disappear in one of the pigeonholes of Athens, it would be possible by the year 2000 to begin making productive use of the garbage of the Salonica area.

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PROBLEM OF NORTHERN GREECE INDUSTRIAL POLLUTION SEEN

Athens I AVGI in Greek 9 Oct 77 p 6

/Text/ The pollution of the Ptolemais area by the Public Power Corporation /DEI/ and the Nitrogenous Fertilizer Corp /AEVAL/ plants is the major problem creating deep concern to the public as a result of related published reports. At the same time, no announcement has been made by the plant's management regarding the area's pollution, while an effort /to do so/ by the Greek Chamber of Commerce /TEE/ of Western Makedonia did not come to light following the intervention of Industry Minister Konofagos.

Within the framework of its responsibility with regard to various technical problems and their social impact on the country, TEE formed a work group of technicians, members of the Western Makedonia TEE, to study the sources of pollution of the Kozani-Ptolemais axis which includes an immense complex of lignite mines, three thermoelectric stations and a factory of nitrogenous fertilizers. The group included engineers of the above industries who, after all, were the only ones who knew the problems created in the area. But following a Ministry of Industry circular recommending the management of the enterprises to avoid publishing views or expressing opinions publicly on the question of the environment pollution, the members of the group were reluctant to continue their task. DEI also made the same recommendations thus ending all scientific studies which would have provided a comprehensive picture of the area's basic problem based on a scientific basis.

Following the ministry's intervention and the administrative recommendations of the enterprises, TEE sent a letter to the minister of industry asking him to allow the engineers to participate in the survey. The letters said, in part:

"Because we believe that you will disagree with the obstruction of the study of scientific matters of vital importance to our country, we ask you to encourage the DEI and AEVAL engineers now employed in the Ptolemais industrial complex to participate in the study of the complex problem of the area's pollution thus facilitating TEE in the performance of its work."

The minister's answer (Document No. 2052/77) which can be understood only by those knowing the government policy on sensitive matters such as the pollution of the environment was as follows:

"In response to your request we advise you that you may obtain from the management of the plants any information you need concerning the protection of the environment. With regard to the unwillingness of engineers employed by AEVAL, the Ptolemais thermoelectric station, etc., to participate in the work team we established for determining the sources of the Kozani-Ptolemais area pollution we think that it is preferable to exclude from the above group employees of the aforementioned industrial complexes because the public may have doubts as to the objectivity of the conclusions!!"

This sensitivity of the minister gives rise to two questions: 1) Is it that the minister is so sensitive about the public's doubts concerning the objectivity of the conclusions or can it be that the conclusions could be so alarming that they should not be written and signed by state employees? 2) Who else is more competent to reach sound conclusions than the scientists working in these plants? These engineers, moreover, would be acting as members of the Technical Chamber and not as employees of enterprises in which case the public would have no doubts at all. Without doubt the ministerial "sensitivity" serves other purposes.

Pollution of the Area

The only official document made public concerning the pollution of the Ptolemais area is the 1976-80 5-Year Program report of the Kozani Nome (April 1976) which expresses concern for the pollution rate of the area and mentions the following, in part:

"The problem of atmospheric pollution from industrial gaseous discharges is acute and the data cited below are indicative of the problem's magnitude. It is estimated that factory chimneys and cooling towers of the thermoelectric station emit each hour into the atmosphere a) more than 10 million cubic meters of air pollutants, b) 25 tons of flying dust which later settles on the area's surface, and c) an average of 25 tons of water vapor. The AEVAL plant, moreover, emits into the atmosphere sufficient quantities of hydrogen sulphide, as well as quantities of the very toxic sulphur hydroxide(...) A preliminary investigation made by the Benakeion Phytopathological Institute at the request of the nomarchy led only to anxiety..."

One recent investigation by University of Salonica Health Professor Edipidis, whose conclusions remain secret, places the area's carbon dioxide at much higher levels than the internationally accepted standards, according to reliable information.

In such a climate of concern the daily contact of the area's inhabitants with the polluted atmosphere, individuals of various professions created

a "Committee for Environmental Pollution of the Ptolemais Area" which is actively collecting relevant data for investigating and pinpointing the real degree of the environment's pollution. But such a difficult effort--similar to that of the Ptolemais municipality--will not be effective without the cooperation of TEE, the engineers, the employees of the companies which cause the pollution and, above all, without the state's cooperation and initiative in the research project and the objective publication as soon as possible of the real degree of the area's pollution. Otherwise, it is expected that there will be a public mobilization for the purification of the environment in which they live.

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CLAIM TOXIC MATERIALS ENDANGER ETHYL PLANT WORKERS

Athens TA NEA in Greek 10 Oct 77 p 5

/Text/ Salonica, 10 October (from our correspondent)--The ETHYL-ELLAS /Co./ at the port of Salonica is creating new problems which were the cause for a strong protest on the part of the working people during a meeting yesterday at the Salonica Port Authority /OLTh/ hall. They charged that OLTh is about to sign an agreement for the operation of a /storage/ tank at the port's fifth pier for the purpose of storing and distributing ethylene dibromide. They also made known their concern by pointing out that, according to scientific data, this chemical is extremely toxic and they cannot trust their health or life with the mechanical means and security measures for filtering the poisonous fumes.

In a letter to OLTh, the working peoples' coordinating committee points out that "the recent regulations as prepared and published are in contrast with earlier regulations which allowed only the movement of the material (ethylene dibromide) without storing it.

The people working at the port are demanding that the ethylene dibromide tank be dismantled within 20 days and that the toxic material be transferred at night, as the regulations provide, directly from the boats to the ETHYL-ELLAS tank trucks.

Headaches, dizziness, fatigue, tendency to vomit and sexual impotency are the symptoms from which those working in the company's storage tanks suffer, according to testimony many OLTh workers and technicians gave to the three-member Salonica Misdemeanor Court during the trial of ETHYL-ELLAS executives Emm. Amolokhitis and Leon. Georgiadis who were sentenced for causing bodily injury to OLTh technician Georg. Karapandsios because of their negligence.

The witnesses complained that at the American Hellenic Educational and Progressive Association /AHEPA/ hospital where they were treated, the doctors did not reveal to them the medical findings and gave them discharges indicating that "having improved, they were released from the hospital." The testimony of the witnesses' doctors that the plaintiff worker "suffered

only from colic of the kidney" were disputed by presiding judge Tsenekidis and prosecutor Papadopoulos. The judge specifically pointed out that an effort was being made to prove that the worker does not suffer from lead poisoning while there is a number of symptoms, unrelated to the "colic of the kidney," for which /symptom/ no explanation is given...

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PLUMBERS CHARGE POOR WORKMANSHIP, MATERIALS IN CONSTRUCTION

Athens TA NEA in Greek 10 Oct 77 p 7

/Text/ The whole of Greece is built with serious /materials/ deficiencies, at least as far as plumbing materials are concerned and the more time passes the greater becomes the danger to the people's health.

These charges were made yesterday to media representatives by the very people who make these installations--by the plumbers themselves. The Athens-Piraeus Association of Handicraftsmen for Heating, Plumbing and Air Conditioning Installations organized yesterday's press conference in an effort to restore the professional dignity of its members. Association President Spyros Anagnostopoulos charged the governments of the past 15 years with indifference because they failed to cope with the problem despite the continuous representations by the association. He pointed out that:

"The plumbing installations are not made in a proper way because: 1) the materials used for their construction are different from those that should be used and 2) we, the plumbers, do not make the installations the way we should.

A State of Confusion in Materials

"There is confusion in the materials sector because the state has never felt the need--indispensable for the whole technical world--to prepare technical standard specifications for the construction materials as is done in all advanced countries of the world. Furthermore, the state, despite our continuous charges, failed to take any measures for implementing the regulation, albeit an old one, which has been a law of the state since 1936 but which was never applied in the overwhelming majority of the buildings.

"These two weak sides of the state have been exploited to the utmost by the profiteers with the result that almost all houses have low quality plumbing installations. For this reason it is necessary--and our class

will fight with all means for its success--a) to grant to installers of plumbing materials a trade practicing license depending on their qualifications and years of experience; b) to assign all plumbing installations licensed plumbers who will be responsible to the state for their work, c) to avoid connecting any building with the water and drainage networks before an appropriate declaration is filed by the licensed plumber that the installation was made in accordance with the regulation and the building plan and d) to have all materials we are using standardized."

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BRIEFS

ETHYL PLANT LEAD POISONING--Salonica, 6 October (from our correspondent)--The case of lead poisoning of Salonica Port Authority /OLTh/ workers as a result of the escape of tetrathylide lead from the ETHYL-ELLAS installation will be tried tomorrow at the Salonica three-member Misdemeanor Court. The accused are Emmanouil Ammolokhitis, manager consultant, and Leonidas Georgiadis technical director of the company, and the plaintiff is Georgios Karapandsios a worker-technician who worked at the port's fifth pier near the ETHYL tanks from 16 to 23 May 1975. During this period his health was shaken and he suffered headaches, vomiting, paralysis of the hands and feet, etc. The examinations at the Social Insurance Foundation, the Ippokpateion Hospital and later at a Linz, Austria, hospital proved that he suffered from lead poisoning. /Text/ /Athens TA NEA in Greek 6 Oct 77 p 16/ 7520

CSO:5000

NUCLEAR WASTE POSES ENVIRONMENTAL PROBLEMS

Madrid POSIBLE in Spanish 27 Oct-2 Nov 77 pp 17-20

/Article based on report by Sebastian Cuevas Navarro/

/Text/ In the center of the El Cabril sierra, in the municipal district of Hornachuelos in Cordoba Province, there has been in existence since 1961 an atomic cemetery for the waste materials of nuclear plants and the Nuclear Energy Board /JEN/, composed of thousands of barrels stored at the bottom of an abandoned mine. The sierra has now been useless for decades, despite geologic investigations that have determined the existence of a great reserve of minerals, some of them of great value. However, there is more to the problem than that.

There is a hunting preserve frequented by the group of nuclear energy enterprises, where deer, up to 34 in number, have been hunted. There is a total of 28 springs in close vicinity to the "Beta" mine that rise naturally in the terrain.

The place is without protection in the event of sabotage; there is only one guard and a notice prohibiting passage due to the danger of radioactivity. Inside, within the zone, there is, moreover, the exploitation of lapidary material under the management of the enterprise Aislamic, Silicatos Ibericos, S.L., which extracts the material, grinds it in mills in Fuenteovejuna, and then distributes it throughout the national territory for the most diverse industries, among them the famous ceramic industries of Talavera de la Reina.

If we take into account the rapidity of atomic contamination, natural environmental factors -- water, food, rocks -- through which radioactivity can come, and that, in the case of leakage, thousands of years can go by before its effects can disappear, one can well understand the state of anxiety and fear in which the residents of the towns of the sierra are living

and the danger all this represents for other Spaniards. Our collaborator Sebastian Cuevas Navarro has written the following report for POSIBLE.

At 2200 hours on Thursday, 14 October 1976, the town of Hornachuelos was surprised by the calling of an urgent meeting, extraordinary in character, which had been requested by its alcalde, Don Jose Palencia Carrasco. The councilmen were exactly on time, and in the public gathering place, short of speech and unpretentious, the agricultural workers, shopkeepers, in brief, the people.

The secretary, having read the minutes, announced the only item on the day's agenda: the question of the "atomic cemetery" in the municipal district.

The matters under discussion, regarded in this way and divested of urgency, appear almost normal. There are, however, many things in the background. For example, there appeared more than a year ago a message from the Nuclear Energy Board, enclosing a draft law and its corresponding memorandum, by which the town council was asked permission for the installation of a storage facility for radioactive materials in the locality of El Cabril, in the Albarrana sierra. The "dossier" was lost for a year, apparently in the home of the previous mayor. When Senor Palencia acceded to the position, the secretary reported on what had happened, and it was then that the machinery of opposition went into operation.

Secret Deposit

Before continuing further, however, it has to be established that the storage facility for radioactive materials for which the Hornachuelos town council was asked to give permission was already secretly functioning and, in flagrant violation of any standard of administrative law, had been doing so for the mere trifle of 15 years. Because it was in 1961 that the Nuclear Energy Board had already begun to store atomic wastes in this "nuclear cemetery." Then, almost 15 years later, it asked permission. The installations of the Nuclear Energy Board are located in the Albarrana sierra, near the old mining settlement of El Cabril, where the workers in the pitchblende mines that the Board exploited until 1960 used to live. The installations in themselves consist of a provisional warehouse, a permanent warehouse, and the "Beta" mine, where the residues, which the Board has been sending up in trucks on a monthly basis, are being deposited. In the immediate vicinity of these installations is the Bembezar reservoir, whose waters are used for the irrigation of a fertile and extensive region that takes up a part of the provinces of Cordoba and Sevilla, which it endangers with contamination.

The following agreements had been reached by the time the Hornachuelos town council adjourned the session:

1 -- Emphatically to oppose the installation and, consequently, the subsequent utilization of the warehouse for radioactive wastes referred to.

2 -- To report on the present situation, as well as the previous point, to the higher authorities and competent agencies.

3 -- Again to invite the neighboring municipalities affected by their proximity to urgently take a stand to the same effect.

4 -- To request the Nuclear Energy Board for an explanatory report on the subject for the purpose of assuaging the situation of alarm existing in the town. It is only the last that appears to have produced any effect, which was certainly one of appeasement, as it led to a meeting of the Civil Government on the afternoon of 21 October. The civil governor was accompanied at the meeting by "top executives of the JEN," who brought the slogan of "hushing up the issue," and provision was made for a delegation of the people, in which the mayor, secretary, and several councilmen and residents formed a part. Among these top JEN executives was Don Luis Gutierrez Fodra, fuels manager of the Nuclear Energy Board and a professor of physics and chemistry in industrial processes of the Madrid School of Sciences, who played the leading role. Another principal figure present was Don Agustin Martinez Martinez, an engineer with a doctorate in mining, who was also, as we said, a member of the JEN. The people's delegation had no advisory members.

Hushing Up the Case

It was argued at the meeting that:

The only things stored at the El Cabril mine were residues of low activity, coming from hospitals and the Nuclear Energy Board Center in Madrid, originating from research in the latter and from users of isotopes. It was admitted, however, that also being sent were special equipment from work of low radioactivity coming from nuclear plants and leakages from plants and other centers, since the fuel cylinders "have not gone and will never go to Hornachuelos, because they were sent for reconversion to England and France in lead containers."

The residues were packed in identical drums shielded within by reinforced concrete and numbered and colored with a stripe according to the intensity of their radioactivity on contact.

They argued that these drums -- those of low activity -- had an average life of 10 years. For those of higher radioactivity, the thickness of the reinforced concrete shielding is increased, and their average life was estimated as 40 years.

By 1976 there were 1,500 drums in storage, and at the nuclear plants they are stored in the open air for 5 years before being sent on to El Cabril, with the detection of any defect in a drum prior to its shipment.

Samples are taken on a periodic basis, weekly or biweekly, taking into account that the permissible limit of radioactivity must be that of drinking water, in other words, less than 3.5 for 10 raised to a power of 7.

In the case of sabotage, it would be difficult to imagine that the radioactive material would be broken into and discovered.

The hunting preserve has only been used by the group belonging to the Nuclear Energy Board enterprise, and 34 deer, at the most, have been hunted, after a year of no hunting.

It has not been shown that radioactivity causes cancer.

All these conclusions were reached by members of the Board, in the midst of enormous difficulties posed to any type of dialogue.

Town in Disagreement

For their part, the town inhabitants, political forces of little strength (because, having played no part at the outset in the development of this topic, it was only in the course of events that they had adopted a policy of opposition to the El Cabril installations, although always with a reverential attitude toward the Administration), had reached conclusions of another type.

The first was that the Administration should exert pressure on the Nuclear Energy Board itself.

The second was in regard to the relationship between the dates the nuclear plants were put into operation and the annual increase in the number of drums. Here are the statistics on their storage, taken from the Nuclear Energy Board's memorandum, made public at the meeting of the Hornachuelos town council, which the members of the Board who were minimizing the matter found it difficult to explain:

1961,	5	drums placed in storage
1962,	5	" " " "
1963,	12	" " " "
1964,	9	" " " "
1965,	12	" " " "
1966,	42	" " " "
1967,	20	" " " "
1968,	223	" " " "

(The Jose Cabrera Nuclear Plant in Guadalajara went into operation in July 1968. One of the members of its administrative council is Don Pedro Gamero del Castillo, a Franco minister, managing director of the Banco Hispano Americano, and one of the hosts of the Reichsfurer of the Nazi S.S. /Schutz-Stuffel, or Blackshirts/, Heinrich Himmler, when that sinister personage came to Madrid in 1940.)

1969,	325	drums placed in storage
1970,	111	" " " "
1971,	605	" " " "

(The Santa Maria de Garona Nuclear Plant in Burgos, the property of NUCLEMOR /expansion unknown/ went into operation in March 1971.)

Beginning in 1972, no data are available, although it should be kept in mind that the Vandellos-1 Nuclear Plant, the property of HIFRENSA /expansion unknown/, went into operation at the beginning of that year.

In any case, the total recognized by JEN for the year 1971 amounted to 1,369 drums, and this casts doubt on the assertion that only 1,500 drums were in storage in 1976.

Bearing in mind that the production of waste materials accepted by JEN and transferred to El Cabril can be estimated as one drum or a drum and a half a day, the resulting amount is undoubtledly much greater than the quantity admitted.

Additionally, and in the JEN memorandum itself, the possibility is accepted of unlikely but real theoretical dangers stemming from natural catastrophes or acts of sabotage, including, among the former, those resulting from earthquakes or water filtrations, in view of the existence in the neighborhood of the "Beta" mine of 28 springs that rise naturally in the terrain.

The third objection is that the location has no more protection than a guard and notice prohibiting passage due to the danger of radioactive contamination and that, therefore, any kind of sabotage is possible

To put an end to minimizing matters, the then governor, accompanied by some municipal authorities and a select group of reporters, went up to El Cabril, where they had their pictures taken beside the drums.

The publicity given by the Andalusian magazine TIERRAS DEL SUR to all these reports led me to assume the existence of some sort of trouble or proscription, which led this reporter to write an open letter to the civil governor of Cordoba containing these paragraphs: "The truth is that if this strange warehouse has been functioning since 1961, as you assert, it seems to us that it would have been appropriate to give opportune notice to the Hornachuelos city council and the citizens... Why the devil have you brought it to us, on none other than Andalusian soil? Why weren't the precious wastes taken further up and away from us?"

Storage Continues

The fact is, however, that the passage of time and protests of a democratic town council have been to no avail. A cloak of silence has been placed over the problem, and the trucks, new and bigger than ever, keep on coming, according to what we were told by the inhabitants of Fuenteovejuna and the village of Argallon, through which passes the caravan of death along the sierra road to El Cabril.

The El Cabril or Albarrana sierra is, according to the data of the Cordovan geologist Dr Rafael Cabanas, one of the finest geologic reserves in the world,

where, moreover, even precious metals are to be found, which are now buried, and will be for 10 to 40 years.

The data available to us indicate that the solid wastes of very high radioactivity can sustain an active life of tens of thousands of years. In the case of plutonium-239, an element that does not exist in nature, the inhalation of a thousandth of a gram causes lung cancer, and iodine-131, krypton-85, and tritium are especially dangerous through the contamination of water. The latter enters the food chain, affecting many species and always reaching man.

Effect of Setback

The curious thing about all this is that, if it comes to the worst, we are spreading contamination throughout Spain and, perhaps, throughout Europe, as a result of this setback. It is not, this time, due to contamination of the waters, such as took place in the Tajo River following a leak in the Nuclear Energy Board installation in Madrid. While the attempt was made to keep this secret, it had affected the Tajo vegetable gardens, and this led to the purchase by the JEN of the entire cabbage and lettuce crop and (why not!) its removal and storage in the El Cabril sierra. I am referring to the contamination due to the dispersion of the lapidary material in the surrounding area. It happens that the enterprise Aislamic, Silicatos Ibericos, S.L., holds the lease to an area of the sierra from which is extracted material that is ground in a mill at Fuenteovejuna and distributed to the most diverse industries: for example, to the famous ceramic industries of Talavera or the synthetic crystal industries, in which ordinary dishes and glasses are made. And to make things worse, a large amount of this material is transported to Penarroya, from where whole train loads, apparently, leave for England. The Aislamic enterprise, according to rumors, is experiencing difficulties, and it is said in Fuenteovejuna that it may transfer the use of its quarries and installations to a French firm, although there is also talk of the INI [National Institute of Industry]. Layoffs have already begun.

This is the way things are going, so it seems that a firm decision of a city council and the apparently unanimous one of the Andalusians have not been taken into account by the Administration.

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END